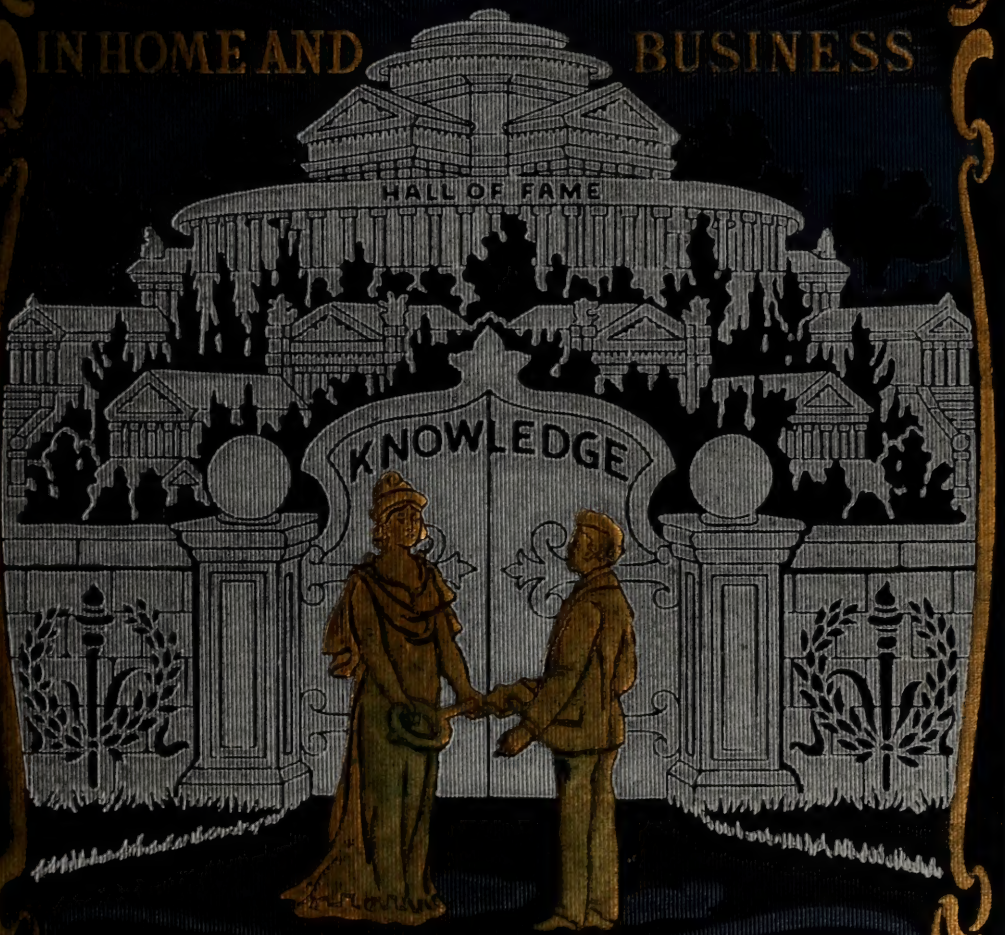
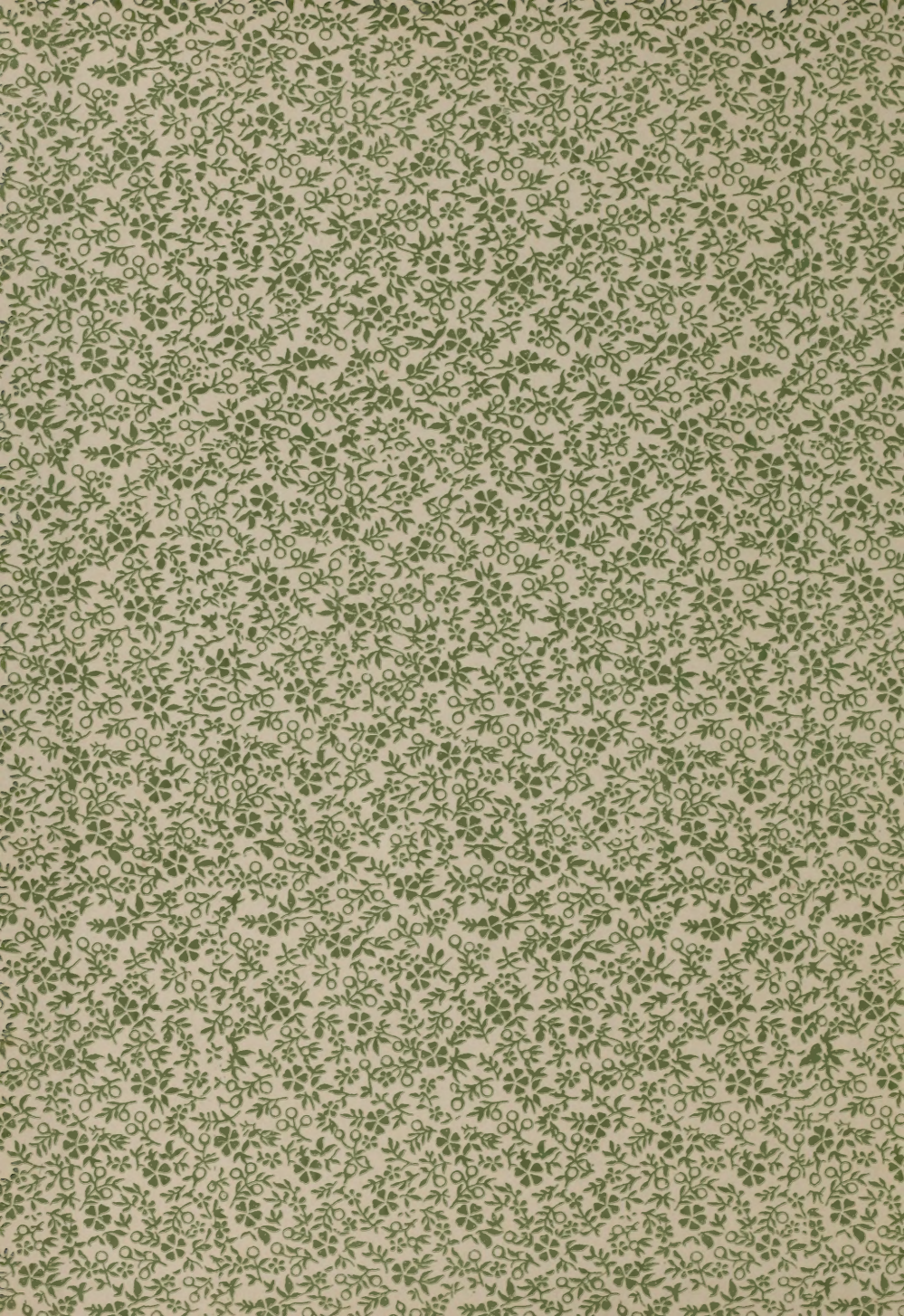
SUCCESS AND HAPPINESS

IN HOME AND BUSINESS



INFORMATION NECESSARY TO SUCCEED IN BUSINESS AND SOCIAL LIFE



ON THE ROAD TO SUCCESS

Industry and education are essentials to success. There are avenues open to wealth and distinction for every man and woman who is prepared to grasp the opportunity. Self-help is often the best help.

Success and Happiness
In Home and Business

INFORMATION NECESSARY TO SUCCEED IN ALL DEPARTMENTS OF BUSINESS AND SOCIAL LIFE

—EMBRACING—

Useful Science, History and Biography, Banking and Commerce, The Practical Mechanic, Every Day Law, Social and Business Forms, Decorations of the Home, Music and Song, Rules of Etiquette, Games and Amusements.

INSPIRING LESSONS FROM THE LIVES OF SUCCESSFUL MEN
THEIR ADVICE, EXPERIENCE AND MAXIMS

EDITED BY

CHARLES MORRIS, LL.D.

Editor of "Twentieth Century Cyclopedia," "The Handy Dictionary of Biography," "Thomas' Biographical Dictionary" (Revised Edition), and many other Books of Reference. Author of numerous Standard Works on History, Biography and Science.

Profusely Illustrated by Full Page Half-tones and Numerous Portraits and Text Drawings

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PREFACE

This is an age of great things, great thoughts, great inventions, and great events. New ideas are crowding upon the old. The world is at sea, and daily touching upon some fresh shore of fancy or fact. What was up-to-date in the closing years of the old century is rapidly being left behind in the opening years of the new. Business in all its branches, industry in its many departments, have spread and expanded until we scarcely recognize them under their new faces and forms.

To keep up with business and with the race of events we must possess the necessary means of progress, and of these means the best are books — books of reference, of information, of ways and means, of figures and facts. Success to-day comes first to those who are best prepared to take advantage of all opportunities as they offer, and to those who have the best practical education. Recognizing this, and realizing that *self-help* is in all cases the *best help*, and *home instruction* often the *best instruction*, publishers, of recent years, have been deluging the world with books of ready reference — dictionaries, encyclopædias, compendiums, and works under varied titles, all intended for the one important end of supplying this earnest demand of the people at large. In these days of active thought and busy enterprise, to live without an encyclopædia of information is to pass through life seriously handicapped.

You must *keep gathering knowledge* or you will *stagnate*. You must fill your mind with information if you would be ready to grasp opportunity as it flies. And yet no man, no matter how retentive his memory, can keep in mind more than a small fraction of the things desirable to know. Facts are accumulating too fast for that. There are thousands of events which the best of us cannot hope to keep in our memories, like coins in our purse, ready to pay out promptly on demand. It is for this reason that books of reference are necessary, works in which facts of all kinds may lie conveniently packed away, indexed and ticketed, ready to lay hand upon at a moment's notice.

We have been looking through the various works of this kind. There are many of them, as we have said. Yet we are constrained to say that those we have seen are disappointing. *Here* is a glaring omission in one field of information; *there* a serious deficiency in another. Many of them are most notable for *what they fail to tell.* They promise, but do not fulfil. They bristle with worn-out information, but fail to grasp the story of the present, to keep abreast of the fast-flowing tide of the times. We have been disappointed, we say. Re-vamped material, obsolete ideas, mossgrown events, collections of antiquities, are not what the world wants. A thoroughly up-to-date and fully reliable book is sadly needed, a book of the times; one new, fresh, vital in character, twentieth-century in tone and style. We have sought in vain for such a work. As we could not

find one, we have made one. We have felt the demand and promptly responded to it, and take pleasure in presenting to the reading public a work which they can accept with the fullest confidence, a book of all facts, a brimming compendium of the knowledge and progress of the world in whose midst we live, a full cabinet of information dealing with every phase of modern affairs.

Facts, we are often told, are stubborn things. They truly are when we call them and they will not come; when we seek them and they are not to be found; when such as we have once met hide themselves away in some obscure recess of our brains, and refuse to come forth in response to our most earnest demand. Facts are elusive and baffling things, escaping us when we most want them, playing about as just out of reach, failing to respond to whistle or call. Yet they are things we need daily; hardly an hour passes in which there is not something that we wish to know, and we seek in the cells of memory in vain. Facts are our tools in trade, the most useful and necessary implements of the man of affairs, the daily need of the mistress of the household, the steady demand of the growing boy and girl; and nothing is more useful in home and office, in school and library, than an ample compendium of the things the world wants to know, a cabinet whose door may be opened at a moment's notice and the stubbornest fact drawn triumphantly forth. All must acknowledge that such a compendium is a very convenient thing to have at one's elbow—indispensable would be a better word. Such a compendium we have here, a work replete with facts in the most satisfying fullness and variety, brimful of useful information suited to all tastes and needs, containing just what every one most wants, from bustling housewife to busy merchant or mechanic, from stirring schoolboy to the young lady about to be launched upon society.

Our Twentieth Century Record of Information

In the whole world of modern books you will find nothing to take the place of this our Twentieth Century Record of Information. You will find it a genuine literary telephone. Call "Hello!" into it whenever you wish and you can depend on getting a prompt and satisfactory reply. Hundreds of wide-awake correspondents, of all times and all professions, lurk within its pages, ready to be called up at any time, always on hand and at leisure, and able to give you the best and most timely information of the day or of the ages. Here you have a true *multum in parvo*, a repertory of sifted, concentrated and digested facts, a systematic and compendious collection, containing just what everybody wants to know—the farmer, the dairyman, the stock-raiser, the mechanic, the business man, the cook and her mistress, the man and woman of society, the writer and reader, the lover of sports and games, the devotee of science, the student of inventions, the dweller in city or country, in fact, anybody who is in search of anything can scarcely fail to find some answer to his demand in these well-filled pages.

You will find here not alone a time-saver, but a money saver as well, capable of paying you back annually ten times the price of the book,—not ten times its value; it must be remembered that value and price are often very different things. Are you in doubt as to the proper form to draw a check or note or some other business paper, or whether it has the proper endorsement; or do you wish to know how to close an account in your Ledger? Open to the Business Department of this book and you will find it there. If your

cow or horse is ailing and drooping, open these pages for your veterinary surgeon. Do you wish information on some legal point? You have here your own lawyer, who asks no fee for his advice. Are you a householder in a rural residence, and something has gone wrong with the plumbing, the woodwork, the furniture, or papering? Well, you can, if your time is otherwise occupied, call in carpenter, plumber, or upholsterer, and pay their bills; but if you have leisure and like exercise, you may find here just what you want to know about tools and materials and methods of work, and, if the difficulty is not a serious one, you will be able to save money and perhaps do as good a job of work as a professional mechanic. This is by no means all. You may be invited to some fashionable social function, or wish to invite some of your fashionable acquaintances to dinner or luncheon, and be in doubt about some small but essential matter of etiquette. You may wish to know how to address some important correspondent or to present a letter of introduction or recommendation. You might ask your friends to help you in your dilemma, but you do not care to confess ignorance on such matters. Nor do you wish to buy a book on etiquette for such a minor affair. Well, you have no need, you will find all you require to know here, and much other useful information about etiquette and correspondence, all fully down to date, telling how men and women should comport themselves in all the social exigencies of life in this new century of the world's history.

These are some of the ways in which this work may save you money. They are not all the ways. We have dealt here with only a few of its many departments. In a dozen ways you may find here information which otherwise you would have to pay for, and often to pay for very dearly. As already said, self-help is the best help.

Having frequently ourselves experienced the various wants above spoken of, we have prepared this encyclopædia for our own convenience as well as for that of others. The editor has sought the assistance, in its preparation, of scholars and practical writers, thoroughly conversant with the topics placed in their hands, with every confidence in the trustworthy results of their labors. Throughout it has been our endeavor to make this work a *practical aid* to those who may have occasion to use it, a guide to success to those who apply to it for business purposes, a means of enjoyment to those who seek in it knowledge about pastimes, and a channel of important information to those who turn to its pages for help in social matters or the many other exigencies of modern life.

The Plan of This Book

Realizing fully that it is not sufficient to have an alphabetical treatment of a multitude of subjects, but rather an intelligent and practically complete separate handling of the various topics of useful information, we have arranged our work in the form of Departments, each embracing some broad field of affairs, and each sytematically subdivided into convenient sections and paragraphs, in which the several topics under each department are clearly and succinctly handled. Thus, in the *Department of Business* an effort is made first to give a sufficient knowledge of *Language*,—the instrument of all communication,—chapters being given on the proper use of English. Then follow lessons on *Penmanship*, illustrated by valuable copy-plates; on *Banking*, *Money*, *Business Forms*, *Bookkeeping*, the ready manipulation of figures, helps in *Everyday Law*, etc. All these form trustworthy sources of reference for men in business, and the best possible assistance in

training the young and the inexperienced. By diligent application and earnest study, one may obtain from these pages all the essential elements of a business education.

This is but one of numerous departments. Those interested in *Science*, for instance, may find here a general *résumé* of the practical applications of scientific discoveries, and a succinct account of all that is new and fresh in scientific discovery and application. These are matters with which every one should be familiar, and the effort has been made to treat the subject broadly and comprehensively. Again, in the field of *Practical Mechanics* will be found helps and suggestions that cannot but appeal to every one who cares to work with hands and tools, or needs to oversee the work of others. The farmer will find his special needs amply dealt with, the schoolboy will require no fuller or more carefully prepared cyclopedia than we present, and persons in every field of life cannot fail to find something adapted to their special needs.

Turning from the practical to the social side of life, this will be found as fully dealt with. The pleasure of existence is largely enhanced by a recognition of the customs prevalent in polished and cultivated society, and the *Laws of Etiquette* become important to all who have to meet others in social intercourse. It will suffice to say that the treatment of this important subject is full and all-embracing. The same may be said of the beautiful Industrial and Historical Charts which have been prepared from the latest authorities and present to the eye in a most striking manner a comparative view of the great Industries of the world and of History of ancient and modern times.

Practical and Inspiring Lessons

The culminating features in this grand work are the chapters devoted to "Inspiring lessons from the lives of successful men". There are certain qualities of pluck, perseverance, industry, thrift, economy, patience, prudence, promptness, cheerfulness, concentration, courage and the like which are found in the lives of those men who have reached the top of fame's ladder, and also of those persons in every community who are looked up to and honored as the leaders in business, the leaders in profession and the leaders in all good works. If we analyze the character of any one of these, we shall recognize the qualities of which we have spoken, and also that each one had an opportunity of gaining practical and useful information such as is contained in this book.

This book has been compiled for the sole purpose of furnishing the *practical and useful knowledge which is necessary to succeed in all departments of business and social life*. If the reader will bear in mind how important all the departments of this work are for success and happiness in home and business, he will receive a beautiful inspiration for living and acting up to the highest ideals by reading the chapters which bear upon the lives of successful men.

"Lives of great men all remind us
We can make our lives sublime,
And departing, leave behind us
Footprints on the sands of time."

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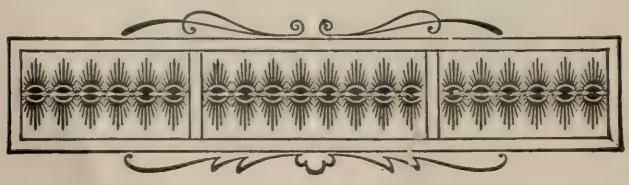


BOOK I.

BUSINESS

PRACTICAL HELPS IN GRAMMAR—SPELLING AND COMPOSITION—LESSONS IN PENMANSHIP WITH MODEL COPIES—FORMS FOR ALL KINDS OF BUSINESS PAPER—MONEY AND BANKING—BOOKKEEPING PRACTICALLY ILLUSTRATED—HOW TO USE FIGURES QUICKLY—BUSINESS LAW—A VOCABULARY OF COMMON BUSINESS TERMS.

A PRACTICAL BUSINESS INSTRUCTOR AND GUIDE

PREPARED AND EDITED BY
PROFESSOR E. C. MILLS, of Rochester, N. Y.,
PROFESSOR R. S. COLLINS, of Philadelphia, Pa.,
AND OTHER SPECIALISTS.

THE LANGUAGE WE SPEAK

ITS INTERESTING HISTORY—ITS FORMATION—ITS MILESTONES —ITS DIVISIONS BY POINTS—ITS GRAMMAR—ITS SPELLING—ITS CORRECT USE—ITS FLOWERS OF SPEECH

OUR MOTHER TONGUE

Language has a history just as the living being who uses it. It has gone through periods of change and development which correspond to the many changes in the history of the race from the few words or sounds of man who lived in the cave to the complete vocabulary of the most learned American. It is of first importance to every one aspiring to success in the correct use of our language to appreciate fully what a wonderful instrument it is. This requires that a brief account be given of its history and composition.

We speak of the "English tongue" or of the "French language"; and we say of two nations that they "do not understand each other's speech." The existence of these three words—*speech*, *tongue*, *language*—proves to us that a language is something *spoken*,—that it is a number of *sounds*; and that the writing or printing of it upon paper is a quite secondary matter. Language, rightly considered, then, is an *organized set of sounds*. These sounds convey a meaning from the mind of the speaker to the mind of the hearer, and thus serve to connect man with man.

It took many hundreds of years—perhaps thousands—before human beings were able to invent a mode of writing upon paper—that is, of representing *sounds* by *signs*. These signs are called *letters*; and the whole set of them goes by the name of the *Alphabet*—from the two first letters of the Greek alphabet, which are called *alpha*, *beta*. There are languages that have never been put upon paper at all, such as many of the African languages, many in the South Sea Islands, and other parts of the globe. But in all cases, every language that we know anything about—English, Latin, French, German—existed for a long time before any one thought of writing it down on paper.

Curious Changes in Language.

Our language has grown; it is growing still; and it has been growing for many hundreds of years. As it grows it loses something, and it gains something else; it alters its appearance; changes take place in this part of it and in that part,—until at length its appearance in age is something almost entirely different from what it was in its early youth. If we had the photograph of a man of forty, and a photograph of the same person when he was a child of one, we should find, on comparing them, that it was almost impossible to point to the smallest trace of likeness in the features of the two photographs. And yet the two pictures represent the same person. And so it is with the English language. The oldest English,

which is usually called Anglo-Saxon, is as different from our modern English as if they were two distinct languages; and yet they are not two languages, but really and fundamentally one and the same. Modern English differs from the oldest English as a giant oak does from a small oak sapling, or a broad stalwart man of forty does from a feeble infant of a few months old.

The English language is spoken by the Anglo-Saxon race in all parts of the world, including England, most parts of Scotland, the larger part of Ireland, the United States, Canada, Australia, New Zealand, and South Africa. In the middle of the *fifth* century it was spoken by a few thousand men who had lately landed in England from the Continent; it is now spoken by nearly *two hundred millions of people.* In the course of the next one hundred years, it will probably be the speech of three hundred millions.

The Family of our English Language.

Our English tongue belongs to the *Aryan* or *Indo-European Family* of languages. That is to say, the main part or substance of it can be traced back to the race which inhabited the high table-lands that lie to the back of the western end of the great range of the Himalaya, or "Abode of Snow." This Aryan race grew and increased, and spread to the south and west; and from it have sprung languages which are now spoken in India, in Persia, in Greece and Italy, in France and Germany, in Scandinavia, and in Russia. From this Aryan family we are sprung; out of the oldest Aryan speech our own language has grown.

Our own language has been in the process of formation for centuries, and that it still is changing and adding new words indicates it has vitality and is a living language. A language is said to be *dead* when it is no longer spoken. Such a language we know only in books. Thus, *Latin* is a dead language, because no nation anywhere now speaks it. A dead language can undergo no change; it remains, and must remain, as we find it written in books. But a living language is always changing, just like a tree or the human body. The human body has its periods or stages. There is the period of infancy, the period of boyhood, the period of manhood, and the period of old age. In the same way, a language has its periods.

We divide the English language into periods, and then mark, with some approach to accuracy, certain distinct changes in the habits of our language, in the inflexions of its words, in the kind of words it preferred, or in the way it liked to put its words together. But we must be carefully on our guard against fancying that, at any given time or in any given year, the English people threw aside one set of habits as regards language, and adopted another set. It is not so, nor can it be so. The changes in language are as gentle, gradual, and imperceptible as the changes in the growth of a tree or in the skin of the human body. We renew our skin slowly and gradually; but we are never conscious of the process, nor can we say at any given time that we have got a completely new skin.

—Bearing this caution in mind, we can go on to look at the chief periods in our English language. These are five in number: and they are as follows:—

I. Ancient English or Anglo-Saxon,	449–1100
II. Early English,	1100–1250
III. Middle English,	1250–1485
IV. Tudor English,	1485–1603
V. Modern English,	1603–1900

These periods merge very slowly, or are shaded off, so to speak, into each other in the most gradual way. If we take the English of 1250 and compare it with that of 900, we shall find a great difference; but if we compare it with the English of 1100 the difference is not so marked. The difference between the English of the twentieth and the English of the fourteenth century is very great, but the difference between the English of the fourteenth and that of the thirteenth century is very small.

The Grammar of the Language

Was fixed before the seventeenth century, most of the case-endings having entirely vanvanished. The vocabulary of the language, however, has gone on increasing, and is still increasing; for the English language, like the English-speaking peoples, is always ready to offer hospitality to all peaceful foreigners —words or human beings— that will land and settle within their coasts. And the

tendency at the present time is not only to give a hearty welcome to newcomers from other lands, but to call back old words and old phrases that had been allowed to drop out of existence. Tennyson, Lowell and other of our modern writers have been among the chief agents in this happy restoration.

The Vocabulary Increased.

When the Angles or English went over to the British Isles in the fifth century, the number of words in the language they spoke was probably not over *two thousand*. Now, however, we possess a vocabulary of perhaps more than *one hundred thousand words*. And so eager and willing have we been to welcome foreign words, that it may be said with truth that: *The majority of words in the English Tongue are not English*. In fact, if we take the Latin language by itself, there are in our language more *Latin* words than *English*. But the grammar is distinctly English, and not Latin at all.

We must not forget what has been said about a language,—that it is not a printed thing—not a set of black marks upon paper, but that it is in truest truth a *tongue* or a *speech*. Hence we must be careful to distinguish between the *spoken* language and the *written* or *printed* language; between the language of the *ear* and the language of the *eye;* between the language of the *mouth* and the language of the *dictionary;* between the *moving* vocabulary of the market and the street, and the *fixed* vocabulary that has been catalogued and imprisoned in our dictionaries. If we can only keep this in view, we shall find that, though there are more Latin words in our vocabulary than English, the English words we possess are *used* in speaking a hundred times, or even a thousand times, oftener than the Latin words. It is the genuine English words that have life and movement; it is they that fly about in houses, in streets, and in markets; it is they that express with greatest force our truest and most usual sentiments—our inmost thoughts and our deepest feelings. Latin words are found often enough in books; but, when an English man or woman is deeply moved, he speaks pure English and nothing else. Words are the coin of human intercourse; and it is the native coin of pure English with the native stamp that is in daily circulation.

How Strange Words Come In.

The different peoples and the different circumstances with which our race has come in contact, have had many results—one among others, that of presenting us with contributions to our vocabulary. Kelts were found in England; and hence we have a number of Keltic words in our vocabulary. The Romans held the island for several hundred years; and when they had to go in the year 410, they left behind them a few Latin words, which we have inherited. In the seventh century, Augustine and his missionary monks from Rome took over a larger number of Latin words; and the Church which they founded introduced even more and more words from Rome. The Danes began to go over to England in the eighth century; there was for some time a Danish dynasty seated on the throne of England; and hence there are many Danish words. The Norman-French invasion in the eleventh century took over many hundreds of Latin words; for French is in reality a branch of the Latin tongue. The Revival of Learning in the sixteenth century gave us several thousands of Latin words. And wherever English-speaking sailors and merchants have gone, they have brought back with them foreign words as well as foreign things—Arabic words from Arabia and Africa, Hindustani words from India, Persian words from Persia, Chinese words from China, and even Malay words from the peninsula of Malacca.

Spanish Words.—The words we have received from the Spanish language are not numerous, but they are important. The following are a few of them:—

Alligator, Armada, Barricade, Battledore, Bravado, Buffalo, Cargo, Cigar, Cochineal, Cork, Creole, Desperado, Embargo, Filibuster, Flotilla, Grenade, Guerilla, Indigo, Merino, Mosquito, Mulatto, Negro, Octoroon, Quadroon, Renegade, Savannah, Tornado, Vanilla.

Italian Words.—Italian literature has been read and we owe to the Italian language a large number of words. The following are a few of the more common ones:—

Alarm, Alert, Alto, Balcony, Bandit, Bankrupt, Bravo, Brigade, Brigand, Bust, Cameo, Canteen, Canto, Carnival, Cartoon, Cascade, Citadel, Concert, Cornice, Corridor, Cupola, Ditto, Domino, Folio, Fresco, Gazette, Granite, Guitar, Incognito, Influenza, Lava, Madonna, Malaria, Manifesto, Motto, Moustache, Niche, Opera, Pantaloon, Pianoforte, Piazza, Portico, Ruffian, Serenade, Sonnet, Soprano, Stanza, Studio, Tenor, Trombone, Umbrella, Vista, Volcano.

DUTCH WORDS.—The Dutch are a great seafaring people and have given us a number of words relating to the management of ships. The following are a few words which we owe to the Netherlands:—

Ballast, Boom, Boer, Hoy, Luff, Reef, Skates, Skipper, Sloop, Smack, Smuggle, Yacht, Yawl.

It will be interesting to note a few words which come directly from the Latin:

Antecessor, Benediction, Cadence, Captive, Conception, Coffin, Corpse, Debit, Dilate, Example, Fabric, Faction, Fact, Fidelity, Fragile, Gentile, History, Hospital, Legal, Master, Mint, Nutriment, Oration, Particle, Pauper, Penitence, Persecute, Quiet, Radius, Regal, Respect, Secure, Senior, Separate, State, Tract, Tradition, Zealous.

Also that the following come to us from the Latin through the French:

Ancestor, Benison, Chance, Caitiff, Conceit, Coffer, Corps, Debt, Delay, Sample, Forge, Fashion, Feat, Fealty, Frail, Gentle, Hotel, Loyal, Mr., Money, Nourishment, Orison (a prayer), *Parcel, Poor, Penance, Pursue, Story.*

Scientific Terms.

A very large number of discoveries in science have been made in this century; and a large number of inventions have introduced these discoveries to the people, and made them useful in daily life. Thus we have *telegraph* and *telegram; photograph; telephone* and even *photophone* and *megaphone.* The word *dynamite* is also modern. Then passing fashions have given us such words as *athlete* and *æsthete.* In general, it may be said that, when we wish to give a name to a new thing—a new discovery, invention, or fashion—we have recourse not to our own stores of English, but to the vocabularies of the Latin and Greek languages.

The English Language for Ten Centuries.

We can mark out a few guide posts in the path of ten centuries traversed by our language each distinguished by a great event. A reference to any good History of England will give the reader particulars which will be fascinating and instructive. We give a few of the important events and dates which we should endeavor to remember.

1. *King Alfred* translated several Latin works into English, among others, Bede's 'Ecclesiastical History of the English Nation' . . . . . (851) 901
2. *The Norman Conquest*, which introduced Norman-French words 1066
3. *Anglo-Saxon Chronicle*, said to have been begun by King Alfred, and brought to a close in 1160
4. *Sir John Mandeville*, first writer of the newer English Prose—in his 'Travels' which contained a large admixture of French words 1356
5. *Wyclife's Bible* 1380
6. *Geoffrey Chaucer*, the first great English Poet, author of the 'Canterbury Tales'; born in 1340, died 1400
7. *William Caxton*, the first English printer, brings out in Germany the first English book ever printed 1471
8. *First English Book* printed in England (by Caxton) the 'Game and Playe of the Chesse' 1474
9. *William Tyndale*, by his translation of the Bible "fixed our tongue once for all." His New Testament has become the standard of our tongue: the first ten verses of the Fourth Gospel are a good sample of his manly Teutonic pith" . . . 1526-30
10. *Edmund Spencer* publishes his 'Faerie Queene.' "Now began

the golden age of England's literature; and this age was to last for about fourscore years" 1590

11. *Our English Bible*, based chiefly on Tyndale's translation. "Those who revised the English Bible in 1611 were bidden to keep as near as they could to the old versions, such as Tyndale's". 1611

12. *William Shakespeare* carried the use of the English language to the greatest height of which it was capable. He employed 15,000 words. (Born 1564) . 1616

13. *John Milton*, "the most learned of English poets," publishes his 'Paradise Lost,'—"a poem in which Latin words are introduced with great skill" . . . 1667

14. *John Bunyan* writes his 'Pilgrim's Progress'—a book full of pithy English idiom. "The common folk had the wit at once to see the worth of Bunyan's masterpiece, and the learned long afterwards followed in the wake of the common folk" (Born 1628) 1688

15. *Dr. Samuel Johnson* was the chief supporter of the use of the "long-tailed words in *osity* and *action*," such as his novel called 'Rasselas,' published, ... 1759

16. *Tennyson*, Poet-Laureate, a writer of the best English—"a countryman of Robert Manning's, and a careful student of old Malory, has done much for the revival of pure English among us" 1890

The Grammar of the English Language.

Whatever may be said of the English language in other respects, in simplicity it undoubtedly surpasses the rest of European tongues. It is free from intricacies of case, declension, mood, and tense. Its words are subject to but few terminational changes. Its substantives have no distinctions of gender except what nature has made. Its adjectives admit of such changes only as are necessary to denote the degrees of comparison. Its verbs, instead of running through all the varieties of ancient conjugation, suffer few changes. With the help of prepositions and auxiliaries, all possible relations are expressed, while the words for the most part retain their forms unchanged. We lose from this, no doubt, in brevity and strength; but we gain vastly in simplicity. The arrangement of our words is, in consequence, less difficult, and our sentences are more readily understood. The rules of our syntax are exceedingly simple, and the acquisition of our language is easy in proportion.

Parts of Speech.

Having traced briefly the history of our language, considered some of the sources from which it is derived, and noted its chief characteristics, we shall now proceed to treat of its words, viewed with reference to the respective parts they perform in a sentence. Some knowledge of grammar from text-books being presupposed, we shall here, by a brief summary, merely recall to mind its leading principles, with such definitions and illustrations only as are absolutely essential for practical purposes.

The classes into which words are divided with reference to their use and mutual relations, are called Parts of Speech. They are nine in number.

Nouns are names of things. They are divided into two classes: Common Nouns, or names that distinguish one class of objects from another—as *girl*, *lake*, *book*; and Proper Nouns, or names that distinguish one individual of a class from another, as *Rome*, *John*.

The term Substantive is frequently used as synonymous with *noun*. Besides nouns, it embraces whatever may be used as such; that is, pronouns, verbs in the infinitive, and clauses.

To nouns belong (a) Gender; masculine, feminine and neuter.

(b) Number: singular and plural.

(c) Case: nominative, possessive, objective and vocative.

Pronouns are words that may be used instead of nouns.

They are comprised in the following classes:—

1. Personal, or such as show by their form what person they are; that is, whether they represent the person speaking, the person spoken to, or the object spoken of. The Personals are,

I, *thou*, *he*, *she*, *it*, and their compounds, *myself*, *thyself*, *himself*, *herself*, *itself*.

2. POSSESSIVE, such as denote possession. They are: *Substantive possessive: Mine*, *thine*, *his*, *hers*, *ours*, *yours*, and *theirs*, *Adjective possessive: my*, *thy*, *his*, *her*, *our*, *your*, *their*.
3. RELATIVES, or such as relate to a substantive going before, called an antecedent. The relatives are, *who*, *which*, and *that*. *What*, *whatever*, *whoever*, and *whichever*, include the antecedent, and are called compound relatives.
4. INTERROGATIVES, or such as are used to ask questions. The interrogatives are, *who*, *which* and *what*.
5. ADJECTIVE PRONOUNS, or such as on some occasions take the place of substantives, and on others are used with them, like adjectives. Under this head fall the words, *this*, *that*, *each*, *every*, *either*, *neither*, *no*, *none*, *any*, *all*, *such*, *some*, *both*, *other*, *another*.

ADJECTIVES are words which describe or limit substantives; as, The *ten great* authors.

The ARTICLES are included as adjectives and are placed before nouns to show whether they are used in a particular or general sense. We have two articles, *the*, called DEFINITE, and *an* or *a*, called INDEFINITE.

VERBS or words that express an action or state; as, "He *is* sure *to succeed*." That respecting which the action or state is primarily expressed is called the SUBJECT of the verb; thus, in the preceding example, *he* is the subject of the verb *is*.

Verbs are divided into two classes: TRANSITIVE, or such as express an act done to an object; and INTRANSITIVE, or such as express a state, or an act not done to an object. "James *reads* Latin," "James *can swim*," "James *is* asleep"; in the first sentence the verb is transitive; in the last two, intransitive.

To show the relation which the subject bears to the action expressed, transitive verbs have two distinct forms, called VOICES. The ACTIVE VOICE represents the subject of the verb as acting; as, "Cæsar *conquered* Pompey." The PASSIVE VOICE represents the subject of the verb as acted upon; as, "Pompey *was conquered* by Cæsar."

To verbs belong person, number, Mood, Tense, and Voice. In person and number the verb agrees with its subject.

Mood, or *Mode*, is the form of the verb which shows the manner of the action or condition expressed. The English verb has five moods: *indicative*, *potential*, *subjunctive*, *infinitive* and *imperative*.

The INDICATIVE mood expresses an absolute affirmation.

The POTENTIAL mood expresses possibility, inclination, ability, duty. Its signs are the auxiliary verbs, *may*, *can*, *must*, *might*, *could*, *would*, *should*.

The SUBJUNCTIVE expresses a condition. Its ordinary sign is *if*.

The INFINITIVE mood expresses action or condition without restriction of number or person. A verb in the infinitive mood has no subject, and consequently can make no affirmation.

The IMPERATIVE mood expresses a command.

Tense is the form of the verb which indicates the time of the action or condition.

The English verb has six tenses, the *present*, *perfect*, *present perfect*, *pluperfect*, *future*, and *future perfect*.

The PRESENT tense expresses a present action or condition; "It freezes."

The PERFECT tense expresses what took place, or was taking place in time past; "It froze." "It was freezing."

The PRESENT PERFECT tense expresses an action or condition indefinitely passed; "It has frozen."

The PLUPERFECT tense expresses what had occurred before some time past; "It had frozen before my departure."

The FUTURE tense expresses what will happen in future time; "It will freeze."

The FUTURE PERFECT tense expresses what will have happened after some future time specified or implied; "It will have frozen by four o'clock."

PARTICIPLES, are words which, partaking of the nature of adjectives and verbs, describe a substantive by assigning to it an action or a state. Transitive verbs have six participles, three in the active, and three in the passive, voice; as, *loving*, *loved*, *having loved*, and *being loved*, *loved*, *having been loved*. Intransitive verbs, admitting of no passive voice, have but three participles; as, *walking*, *walked*, *having walked*.

ADVERBS, are words added to verbs, participles, adjectives, and other adverbs, to express time, place, degree, comparison, manner, &c.; as, *now*, *here*, *very*, *so*, *gracefully*. Adverbs of manner for the most part end with the letters *ly*. This class of words must be carefully distinguished from adjectives, which also express manner or quality, but are always joined to substantives.

CONJUNCTIONS, used to connect words, sentences, and parts of sentences. The most common are,

and,	but,	if,	or,	though,
as,	except,	lest,	since,	unless,
although,	either,	nor,	that,	whether.
because,	for,	neither,	than,	yet,

PREPOSITIONS, which show the relations between substantives and other words in a

sentence. The following list contains the most common ones :

about,	at,	by,	into,	through,
above,	before,	down,	out of,	to,
across,	behind,	during,	of,	touching,
after,	below,	except,	off,	upon,
against,	beneath,	for,	on,	with,
along	beside,	from,	over,	within,
among,	between,	in,	save,	without.

INTERJECTIONS are used to denote a sudden emotion of the mind ; as, *ah*, *alas*, *O*, *oh*, *fie*, *hist*, &c.

Of these parts of speech, the noun, pronoun, and verb alone are inflected ; that is, undergo changes in termination to denote different cases, numbers, persons, &c.

That we may determine to which of the above classes a word belongs, we must examine the relations it sustains to the rest of the sentence ; and, as in different connections the same word often performs very different offices, it follows that in one sentence it may be one part of speech, and in another, another, according to its application. Reference to the dictionary and the meaning of the word will help decide the class to which a word belongs.

About Sentences.

All written or spoken language arranges itself into sentences which are described as assemblages of words which make complete sense ; as, "God is love."

Every sentence consists of two parts, subject and predicate.

The SUBJECT is that respecting which something is affirmed. In the above example, *God* is the subject.

The Predicate is that which is affirmed respecting the subject. In the above example, the words *is love* constitute the predicate.

As regards their signification, sentences are divided into four classes ; viz., Declarative, Interrogative, Imperative, and Exclamatory.

A Declarative Sentence is one that declares something. *The sun shines.*

Declarative sentences constitute the greater part of written language.

An Interrogative sentence is one that asks a question, and is generally introduced by an interrogative pronoun, *who*, *which*, or *what ;* or, by an auxiliary, *do*, *am*, *have*, *shall*, *may*, &c.

An Imperative sentence is one that expresses a command, an exhortation, an entreaty, or permission, and is generally introduced by a verb in the imperative mood, *let* being often used for that purpose; as, "Go in peace ;" "Let him arise." The subject of an imperative sentence is often understood.

An Exclamatory Sentence is one that exclaims something ; as "How it snows !"

As regards their construction, sentences are divided into three classes, Simple, Compound and Complex. Simple sentence are such as make complete sense when used alone.

Compound Sentences are such as have two or more simple sentences.

Complex Sentences are such as have a principal or independent sentence modified by one or more subordinate clauses or sentences.

Mistakes in Grammar

When words are used in improper forms, as "seen" for "saw," and "done" for "did," or when the use of one word is confused with that of another, we say that the user is ungrammatical and ignorant. A moderate knowledge of the grammar will enable every one to speak and write ordinary sentences correctly. But this should be supplemented by careful observation of the usage of the best writers and speakers. One should correct his own mistakes when discovered, and exercise care in not repeating these mistakes. Note the following errors which are to be avoided and test your own language and productions to see that they are clear of these errors.

1. Do not use the objective in place of the nominative ; as, "Him and me did it." Say "He and I."

2. Do not use the nominative for the objective of the pronoun ; as, "*who* are you looking for ?" instead of *whom*. This is an error that can always be avoided by putting the preposition at the beginning of the sentence, not at the end : as, "For *whom* are you looking ?"

3. Do not use *like* instead of *as ;* "She looked like [as] she did a year ago."

4. Do not use *them* for *those*, or *this here* for *this;* as "Give me them books."

5. Do not use *done* for *did*, *seen* for *saw*, *has went* for *has gone*, and similar improper forms of verbs.

6. Do not confuse use of each other and one another. The former should only be used in reference to two persons: "Let us all then promise each other [one another.]"

7. Do not confuse a transitive verb with an intransitive. Say "I lie, lay or have lain on the sofa" and "I lay, laid or have laid the book on the table." So also in the use of *sit* and *set*, *raise* and *rise*, *lean* and *teach*, and other verbs.

8. Do not use singular form of a verb with plural subject or more than one subject; as "The man and woman is at the door;" "The theatres is crowded."

9. Do not use a plural verb with a singular subject. This mistake often happens when a plural noun or two connected singular nouns are connected with the subject; as, "The Story of all his adventures and wanderings make [makes] an interesting book."

10. Do not use two negatives instead of one; as, "I didn't see no one."

11. Do not say don't for doesn't in the third person singular of the present indicative; as "It don't [doesn't] matter." "He don't [doesn't] know." This is a mistake of frequent occurrence even among cultured people.

12. Do not use adjectives for adverbs in "ly"; say, "The birds fly swiftly" not "swift," and "He writes well" not "good." On the other hand do not use adverbs in "ly" for adjectives; say "She looks beautiful," not "beautifully."

13. Avoid the use of slang; as, "You bet," "level best," "go it blind" and similar expressions.

14. Do not use Superlative of the adjectives when Comparative is required; say "He is the stronger of the two," not "strongest."

How to Use Capital Letters

It is of the greatest importance that the Capital Letters be used correctly and in accordance with some fixed rules, or otherwise the manuscript will have a very untidy appearance, and confusion in meaning may arise in the mind of the reader. The correct use of Capitals in letters is an art easily cultivated and will often be the means of securing favorable consideration for the one who pens the letter.

We here give the most important rules which, if followed, will secure correct use of Capital Letters.

The Small Letters of our Alphabet constitute the great bulk of all kinds of printed or written matter. Capitals, however, are employed in certain cases at the commencement of words, for the purpose of attracting special attention.

Begin with a Capital, (1) The first word of every sentence; (2) All proper nouns, and titles of office, honor, and respect; as, *Rome*, *Avenue*, *Mr. Chairman*, *Dr. Franklin*, *Gen. Washington*.

Under this head fall adjectives, as well as common nouns, when joined to proper nouns for the purpose of expressing a title; as, Alexander the *Great*, *King* William, *Good Queen* Bess.

(3) All adjectives formed from proper nouns; as, *Roman*, *Spanish*, *Elizabethan*.

(4) Adjectives denoting a sect or religion, whether formed from proper nouns or not; as, *Catholic*, *Protestant*, *Universalist*.

(5) Common nouns when spoken to, or spoken of, in a direct and lively manner, as persons, that is personified.

(6) The first word of every line of poetry; as,

"Should certain persons die before they sing."

(7) All appellations of the Deity, and the personal pronouns *he* and *thou* when standing for His name.

(8) The first word of a direct quotation; that is, one that forms a complete sentence by itself and is not connected with what precedes by *that*, *if*, or any other conjunction, as, "Remember the old maxim: 'Honesty is the best policy.'"

(9) The pronoun *I*, and the interjection *O*, must always be written with Capitals.

(10) Begin with a Capital every noun, adjective, and verb, in the titles of books and headings of chapters; as, "Hervey's '*Meditations* among the *Tombs*.'" "Ernest Seton Thompson's 'Wild Animals I Have Known.'"

Observe the difference between the interjections *O* and *oh*. The former is used only before

the names of objects addressed or invoked, is not immediately followed by an exclamation-point (!) and must always be a capital; the latter is used by itself to denote different emotions of the mind, has an exclamation-point after it, and begins with a Small Letter, except at the commencement of a sentence.

Use a Small Letter in all cases where one of these rules does not apply. When in doubt, use a Small Letter.

Use of Punctuation Marks

Punctuation may be called the art of dividing written language by points, in order that the relations of words and clauses may be plainly seen, and their meaning be readily understood.

In spoken language, these relations are sufficiently indicated by the pauses and inflections of the voice; but as written language has no such aids, it is necessary to supply the deficiency with arbitrary marks.

The ancients originally wrote their manuscripts without marks or divisions of any kind. Points are said to have been first used about 200 B. C., by Aristophanes, a grammarian of Alexandria, but did not come into general use for several centuries. The modern system of punctuation was invented by Manutius, a learned printer who flourished in Venice at the commencement of the sixteenth century. To him we are indebted for developing the leading principles of the art, though in some of their details they have since that time undergone considerable modification. As there is no man at whose hands business or friendship does not require an occasional letter, so there is none that need be unable, by a proper use of points, to make his meaning intelligible.

Good usage differs widely in regard to punctuation; it is therefore impossible to lay down any fixed rules on the subject. Let the following general principles with regard to punctuation be constantly borne in mind.

The principal use of points is to separate words and clauses, and indicate the degree of connection between them. Thus, clauses between which the connection is close must be separated by commas; those in which it is more remote by semicolons.

(2) They perform another office by showing to what class a sentence belongs. Thus, "George is well," followed by a period is a declarative sentence, asserting that George is in good health; followed by an interrogation-point, it is an interrogative sentence, and implies belief that he is well together with an inquiry whether it is not so; in other words, it is equivalent to "George is well; is he not?" This important difference of meaning can be conveyed in no other way than by the use respectively of the period and interrogation-point.

(3) Points are also employed to indicate a sudden transition or break in the construction or meaning. Thus, where a sentence is suddenly interrupted or broken off, a dash is placed; as, "Woe to the destroyer! woe to the——."

(4) Finally they are used to denote the omission of words. Such is the office of the commas in the following sentence: "Reading maketh a full man; conference, a ready man; writing, an exact man." The verb *maketh* being left out in the last two clauses, commas are inserted to denote the omissions.

(5) Never introduce a point unless you have some positive rule for so doing. Whenever there is any reasonable doubt as to the propriety of employing a comma, do not use it. The tendency of punctuators at the present day is to introduce too many points.

The characters used in punctuation are as follows:

Period,	.	Semicolon	;
Interrogation-Point,	?	Comma,	,
Exclamation-Point,	!	Dash,	—
Colon,	:	Parentheses,	( )
		Brackets,	[ ]

WHEN TO USE THE PERIOD. — The period should be used, (1) After every declarative and imperative sentence; as, "Honesty is the best policy."—"Fear God."

(2) After every abbreviated word; as, *Dr. Geo. F. Johnson, F. R. S.*

(3) After Roman capitals and small letters when used for figures; as "Charles I. was the son of James I."

THE COLON. — The colon is used to separate sentences which are only slightly connected and not completely separated as in the case of the period.

It is placed before a formal enumeration of particulars, and a direct quotation when

referred to by the words *thus, following, as follows, this, these.*

THE SEMICOLON. — The semicolon is used to separate sentences which are closely related in memory. (1) When several long clauses occur in succession, all having common dependence on some other clause or word, they must be separated by semicolons; as, "If we neglected no opportunity of doing good; if we fed the hungry and ministered to the the sick; if we gave up our own luxuries, to secure necessary comforts for destitute; though no man might be aware of our generosity, yet in the applause of our own conscience we would have an ample reward."

A semicolon must be placed between the great divisions of sentences, when minor subdivisions occur that are separated by commas; as, "Mirth should be the embroidery of conversation, not the web; and wit the ornament of the mind, not the furniture."

When a colon is placed before an enumeration of particulars, the objects enumerated must be separated by semicolons.

THE COMMA.—The comma is used in various ways to separate the parts of the sentence, and to facilitate the reader's comprehension of the sense. The rules for the employment of the comma are many, and as employed in letters, business forms, and in ordinary composition, only the more important of the rules are observed. Examples of its use are so frequent on this and other pages that special ones need not be given here.

(1) A comma is placed between the particulars mentioned in a succession of words all in the same construction.

(2) A comma is placed before and one after every parenthetical expression.

(3) A comma is placed after each pair of words, when each pair is in the same construction.

(4) A comma is used before a quotation closely connected with the preceding words.

(5) A phrase or clause which explains, in any degree, the meaning of any other phrase or clause is separated from it by a comma.

(6) A comma is placed where a word is understood, unless the connection is close.

(7) A comma must be used in sentences which would otherwise be misunderstood.

(8) Expressions repeated must be separated by a comma.

(9) All modifying expressions, unless closely connected with the rest of the sentence, are separated by commas.

(10) Use the comma in all places where its use will tend to make the sense clearer, and where no other mark of punctuation is applicable.

EXCLAMATION AND INTERROGATION POINTS.—The use of Exclamation and Interrogation points is governed by a very few rules of easy application.

(1) An exclamation point is placed after every sentence, clause, phrase or word expressing sudden or violent emotion.

(2) Where special emphasis is required, several exclamation points may be used.

(3) An exclamation point, enclosed in parenthesis, is used to denote surprise.

(4) An interrogation point is placed after every sentence, phrase, clause, or word, which asks a direct question.

(5) An interrogation point enclosed in parenthesis is often used to denote doubt.

THE USE OF QUOTATION AND OTHER MARKS.—(1) Quotation marks are placed before and after words or passages quoted from another author, or represented in narratives as used in dialogue.

(2) Quotations consisting of more than one paragraph have the first quotation mark at the beginning of each paragraph, but the second is used only at the end of the last paragraph.

(3) When a quoted passage requires special attention, the first quotation mark may be used at the commencement of each line.

(4) When one quotation includes another, the latter has but half the first quotation mark before it, and half the second mark after it.

(5) THE PARENTHESIS encloses matter not actually connected with the sentence.

(6) BRACKETS are chiefly used to enclose corrections.

(7) THE HYPHEN is used to separate the syllables of a word.

(8) A sudden turn in a sentence and the omission of a word, or part of a word, are denoted by a Dash.

(9) A DASH is usually placed before the answer to a question, when they both belong to the same line.

(10) A DASH is often used instead of the parenthesis marks, and commonly used before an expression repeated for special emphasis.

(11) THE APOSTROPHE denotes a contraction by the omission of a letter, and also is used as the sign of possessive case.

(12) The CARET is used to show the omission of letters or words.

(13) The ASTERISK, DAGGER, and similar marks are used to refer to notes at the foot or side of the page.

The following are marks of reference, and are generally used to call attention to words, sentences, or notes placed at the bottom of the page :

1. The Asterisk,*. 4. And sometimes the Section, §.
2. The Dagger,†. 5. The Parallel, ‖.
3. The Double Dagger, ‡. 6. And the Paragraph, ¶.

Small letters or figures also are used to call attention to notes at the foot of the page.

The Section (§) is generally used for subdividing a chapter into lesser parts.

The Paragraph (¶) denotes the beginning of a new subject, and in manuscript it is often inserted upon a revisal of the matter to denote that a paragraph should commence in a certain place.

The Index (☞) is used where special attention is desired to be called to something of importance.

Helps in Spelling.

No rules fully meet the requirements for satisfactory helps in spelling, as all rules have exceptions. Frequent reference to the dictionary and careful observation of words which occur in daily reading will help to give one confidence. One should always associate the form of the written word with the meaning. The following will be found helpful, and should be carefully studied :

Words of one syllable ending in *l*, with a single vowel before it, have double *l* at the close ; as, *pill*, *dell*.

Words of one syllable ending in *l*, with a double vowel before it, have one *l* only at the close ; as, *hail*, *rail*.

Monosyllables ending in double *l* when compounded retain but one *l* each ; as, *skilful*, *fulfil*.

Words of more than one syllable ending in *l* have but one *l* at the close ; as, *delightful*, *faithful*. But if the accent fall on the last syllable, they have a double *l ;* as, *befall*, *recall*, etc.

Derivations from words ending in *l* have one *l* only ; as, *equality* from *equal*, *dulness* from *dull ;* except they end in *er* or *ly ;* as, *mill*, *miller*, *full*, *fully*.

Words ending in *e* drop the *e* before the termination *able ;* as, *love*, *lovable ;* except they end in *ce* or *ga*, when the *e* is retained ; as in *change*, *changeable*.

The *i* and *e* often come together in a word, it will be found that in the majority of words *i* and *e* come together after an *l* or a *c*. After an *l*, *i* takes precedence—after a *c*, *e* takes precedence ; as, b*e*l*ie*ve, d*e*c*ei*ve. When in doubt over an *i* and *e* following a *c* or *l*, remember the word *lice*, which serves as a guide, the *i* following the *l*, the *e* the *c*.

Participles in *ing* from verbs ending in *e*, drop the final *e ;* as, *have*, *having*, *love*, *loving ;* unless they come from verbs ending in double *e*, and then they retain both ; as, *see*, *seeing*, *agree*, *agreeing*. The word *dye*, however, is an exception, and retains *e* before *ing—dyeing*.

Adverbs ending in *ly* and nouns in *ment* retain the final *e* of the primitives ; as, *brave*, *bravely ; confine*, *confinement ;* except *acknowledgment* and *judgment*.

Monosyllables ending in a consonant, with a single vowel before it, double that consonant in derivatives ; as, *sin*, *sinner*.

Monosyllables ending in a consonant, with a double vowel before it, do not double the consonant in derivatives ; as, *troop*, *trooper*.

Words of more than one syllable ending in a single consonant, preceded by a single vowel and accented on the final syllable, double that consonant in derivatives ; *compel*, *compelled*, *appal*, *appalling*.

Nouns ending in *y* preceded by a vowel form their plural by adding *s*, as *key*, *keys ;* if *y* is preceded by a consonant, the plural is formed by changing *y* into *-ies ;* as, *fly*, *flies*.

Compound words, whose primitives end in *y*, change *y* into *i*: as, *ugly*, *ugliness*.

How to Write Clearly.

Almost every one can learn to write clearly—that is, so that his meaning may be clear—so far, at least, as clearness depends upon the arrangement of words. Elegance, force and variety of style are far more difficult to acquire; but the observance of a few simple rules will assist much in expressing clearly our ideas. Every one who has occasion to express in writing his thoughts for the entertainment of himself or friends, or to write social or business letters, should at least endeavor to express clearly what he thinks. Of course, this will not take the place of ideas, but will make the ideas of the most practical service.

(1) Use words in their proper meaning.—Refer to the dictionary for doubtful cases.

Do not use *address* for *direct*, *balance* for *remainder*, *beat* for *excel*, *can* for *may*, *couple* for *two*, *dangerous* for *seriously sick*, *drive* for *ride*, *expect* for *suppose* or *believe*, *gent* for *gentleman*, *help* for *avoid*, *mad* for *angry*, *reputation* for *character*, *settle* for *pay*.

(2) Avoid exaggerations—as, *awfully*, *frightfully*, *stupendous* and similar words where "much" or "very" are meant.

(3) When using the Relative Pronoun, use "who" and "whom" in referring to persons; which," referring to animals, things and young children, and "that" for both animals and things.

(4) Observe that appropriate prepositions must follow certain words.

As this rule is constantly violated, a list of a few common adjectives and verbs is here presented, together with the prepositions properly used in connection with them.

Abhorrence *of*.
Accompanied *with* an inanimate object; *by* anything that has life.
Accuse *of*.
Acquaint *with*.
Adapted *to*.
Agree *with* a person; *to* a proposition from another; *upon* a thing among ourselves.
Analogy *between* (when two objects follow the preposition); *to*, *with* (when one of the substantives precedes the verb).
Arrive *at*, *in*.
Attended *with* an inanimate object; *by* anything that has life.
Averse *to*, *from*.
Capacity *for*.
Charge *on* a person; *with* a thing.
Compare *with* (in respect of quality); *to* (for the sake of illustration)
Congenial *to*.
Conversant *with* men; *with* or *in* things; *about* and *among* are sometimes used.
Copy *after* a person; *from* a thing.
Correspond *with*.
Die *of* a disease; *by* an instrument or violence.
Disappointed *of* what we fail to obtain; *in* what does not answer our expectations, when obtained.
Entrance *into*.
Expert *in*, *at*.
Followed *by*.
Militate *against*.
Profit *by*.
Reconcile (in friendship) *to*; (to make consistent) *with*.
Reduce (subdue) *under*; (in other cases) *to*.

Between is applicable to two objects only; *among*, to three or more. "A father divided a portion of his property *between* his two sons; the rest he distributed *among* the poor."

In must not be used for *into*, after verbs denoting entrance. "'Come *into* (not *in*) my parlor, said the spider to the fly.'"

In arranging the words of a sentence, observe

(1) Emphatic words must stand in emphatic positions; *i. e.*, for the most part, at the beginning or at the end of the sentence.

(2) Unemphatic words must, as a rule, be kept from the end.

(3) An interrogation sometimes gives emphasis.

(4) The Subject, if unusually emphatic, should often be transferred from the beginning of the sentence.

(5) The Object is sometimes placed before the Verb for emphasis.

(6) Where several words are emphatic, make it clear which is the most emphatic. Emphasis can sometimes be given by adding an epithet, or an intensifying word.

(7) Words should be as near as possible to the words with which they are grammatically connected.

(8) Adverbs should be placed next to the words they are intended to qualify.

(9) When "not only" precedes "but also," see that each is followed by the same part of speech.

(10) "At least," "always," and other adverbial adjuncts, sometimes produce ambiguity.

(11) Nouns should be placed near the nouns that they define.

(12) Pronouns should follow the nouns to which they refer, without the intervention of any other noun.

How to Write Forcibly.

This is a swift age. There is no time for reading long and tedious communications. To command attention, our ideas must be expressed forcibly, and at the first reading must carry conviction. No better example of this can be found than in the advertisements of our large department stores—or in the letters written by heads of great houses in course of their large correspondence—at the same time force should not be sought at the expense of ease and unity of style. We can define a forcible sentence as one which carries conviction—impression when read.

To secure force of expression:

(1) Choose strong, apt, and meaning words.

(2) Use striking figures or illustrations.

(3) Place the most important thing last and secure an impressive arrangement of words.

(4) Omit needless elements, and secure consequent conciseness of expression.

(5) Employ short, rather than long sentences, and select as modifiers single words and phrases, rather than clauses.

Say, "Henry was inclined to be lazy." Rather than "Henry's tendencies were in the direction of indolence."

Say, "Wishing me to become a scholar, my brother sent me to an academy." Rather than, "My brother felt that he would like me to become a scholar, and so he sent me to an academy."

Say, "A physician who was called, announced that the man had smallpox. This, of course, caused a panic in the household." And not,

"It having been decided to call a physician, when he arrived he said that the disease that the man had was smallpox, and this, of course, produced a great deal of excitement among the people in the house."

An Easy Style is secured when the sentences are agreeable to the ear and are easily spoken. Cultivate the habit of framing sentences mentally before writing them; harsh sounding and awkward words and phrases will then be avoided and harmonious expressions will be used in their places.

Avoid the use of high sounding words and phrases and disagreeable repetition of words or sounds. Avoid also the crowding of too many thoughts into one sentence.

The Use of Figures of Speech.

The English is a figurative language, that is, it is a language in which an idea is expressed by the use of words which may suggest something else than the literal meaning. Unconsciously we use these figures and often are unable to define them if asked to do so.

They are the special tools of our language, and as such, should be handled with care. If used skilfully they add strength and beauty, but if awkwardly used they make the user appear affected and makes him a subject of ridicule.

The more common figures of speech are the following:

Simile is the comparison of one object to another, and is generally denoted by *like*, *as*, or *so*; as, "He shall be like a *tree* planted by the rivers of water."—"Thy smile is *as* the dawn of the vernal day."

Metaphor indicates the resemblance of two objects by applying the name, attribute, or act of one directly to the other; as, "He shall be a tree planted by the rivers of water." Metaphor is the commonest of all the figures.

Allegory is the narration of fictitious events, whereby it is sought to convey or illustrate important truths. Thus in Psalm lxxx., the Jewish nation is represented under the symbol of a vine. Bunyan's "Pilgrim's Progress" is an allegory.

Metonymy is the exchange of names between things related. It is founded, not on resemblance, but on the relation of one expression used, to the idea; as "Hear O *Israel*", i. e., *descendants of Israel*—"Our *ships* next opened a fire," i. e., our *sailors*.—"His *steel* gleamed on high", i. e., his *sword*.

SYNECDOCHE is using the name of a part for that of the whole, the name of the whole for that of a part, or a definite number for an indefinite: as, "The sea is covered with *sails*", i. e., *ships*; "Our *hero* was gray, but not from age", i. e., his *hair* was gray; "*Ten thousand* were on his right hand", i. e., *a great number*.

HYPERBOLE is the exaggeration of attributes, or the assigning to a subject of a wonderful and impossible act as the result of ardent emotion; as, "They [Saul and Jonathan] were *swifter than eagles*, they were *stronger than lions*."

Hyperbolical expressions are of frequent occurrence in common conversation; we often say, *as cold as ice*, *as hot as fire*, *as white as snow*, etc., in all of which phrases the quality is exaggerated beyond the bounds of truth. Their frequency is to be attributed to the imagination, which always takes great pleasure in magnifying the objects before it.

IMAGERY is the representation of past events, or imaginary objects and scenes, as actually present to the senses; as "Cæsar *leaves* Gaul, *crosses* the Rubicon, and *enters* Italy", i. e., Cæsar *left* Gaul, *crossed* the Rubicon, etc.

APOSTROPHE is a turning from the regular course of the subject, into an invocation or address; as, "Death is swallowed up in victory. O death, where is thy sting? O grave where is thy victory?"

PERSONIFICATION, or PROSOPOPÆIA, is the attributing of sex, life, or action to an inanimate object; or the ascribing of intelligence and personality to an inferior creature; as, "The Sea *saw it* and *fled*."—"The Worm *aware* of his intent, *harangued* him thus."

INTERROGATION is the asking of questions, not for the purpose of expressing doubt or obtaining information, but in order to assert strongly the reverse of what is asked; as, "Doth God pervert judgment? or doth the Almighty pervert justice?" This figure imparts animation to style. It is constantly employed in the book of Job.

ANTITHESIS is placing of opposites in juxta-position, for the purpose of heightening their effect by contrast, as, "*A good man* obtaineth favor of the Lord; but *a man of wicked devices* will He condemn." This figure is used with great effect in the Book of Proverbs, x–xv. It is one of the most effective ornaments that can be employed in composition.

CLIMAX is the arrangement of a succession of words, clauses, members, or sentences, in such a way that the weakest may stand first, and that each in turn, to the end of the sentence, may rise in importance, and make a deeper impression on the mind than that which preceded it; as, "Who shall separate us from the love of Christ? Shall *tribulation*, or *distress*, or *persecution*, or *famine*, or *nakedness*, or *peril*, or *sword?*"

IRONY is a figure by which is expressed directly the opposite of what it is intended shall be understood; as when Elijah said to the priests of Baal, who were trying to induce their false god to manifest himself miraculously, "Cry aloud, for he is a god," &c. This figure is often considered under the head of ridicule.

ONOMATOPŒIA is the use of a word or phrase formed to imitate the sound of the thing signified; as when we say, *rat tat tat*, to denote a knocking at the door; *bow wow*, to express the barking of a dog; or, *buzz*, *buzz*, to indicate the noise made by bees.

RAPID BUSINESS WRITING

HOW TO HOLD AND USE THE PEN—THE BEST FORMS FOR ALPHABET—HOW TO ACQUIRE RAPIDITY—STYLES FOR BUSINESS AND SOCIAL USES—BEGINNING AND CLOSING LETTERS—NOTES, CHECKS AND OTHER BUSINESS FORMS

PRACTICAL LESSONS IN USING THE PEN

BY E. C. MILLS, ROCHESTER, NEW YORK,
PRACTICAL PENMAN.

The time has arrived when good penmanship is more of a necessity than an accomplishment. But a few years ago many believed good writers were born, not made. Wherever penmanship has been properly taught the results obtained have been very gratifying, and we feel justified in saying that any one who is not encumbered with some physical or mental deformity can learn to write rapidly and legibly. To say that every one can become an artistic penman would be making a broad statement, but it is no longer doubted that almost any one can learn to write a good business style of penmanship.

In order to accomplish this much time and hard work is necessary for those who have acquired incorrect habits and who have wrong ideas of the meaning of good business writing. It is the aim of the author of this series of lessons to present the subject in such a way that the home learner may acquire, during his spare time, a rapid and legible style of business writing in a comparatively short time.

Before Beginning Practice.

It is often desirable to compare your work at different times with your previous writing, that an accurate estimate may be made of the improvement made. For this reason we would suggest that you write the following in your very best style and preserve for future reference:

Your Place, State, Date.

This is a specimen of my very best penmanship before beginning practice in writing.

(*Sign Your Name.*)

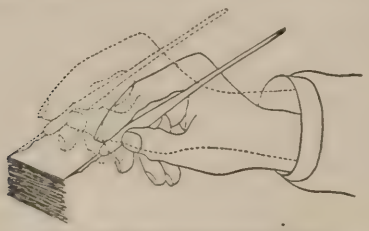
What Materials to Use.

Your progress in penmanship will depend largely upon the materials used. Procure foolscap with a good finish and weight not less than twelve pounds to the ream. Do not try to economize by using poor materials. Ink should be used which flows freely and is black, or nearly so, when first used. Secure a pen that will make a line similar to that of the copies. We would suggest Gillott No. 604 or Esterbrook's A 1 Pen.

Pen-Holding.

The position of the hand and pen in learning to write is of great importance. Study the position of hand and pen in the cut. We do not expect all to assume this position, as no two people hold their pens exactly in the same way The size and shape of the hand have much to do in regard to this

point. It is a pretty safe rule to say that the holder should not be held sufficiently perpendicular to cross the second joint of the first finger, and should not fall much lower than that given in the illustration.



CUT 1. POSITION OF THE HAND AND PEN.

The holder should cross the second finger at the root of the nail, or even just a little higher. The hand should be turned well toward the left, with the third and fourth fingers bent under the hand, resting on their nails. The wrist should not touch the paper.

Position of the Body.

The position of the body, as well as the hand and pen, is of utmost importance and requires the attention of every one who has a desire to improve his writing. A good position cannot be overestimated, and when once acquired is much more healthful and conducive to a free action of the muscles of the arm than an incorrect position. Then let all pay particular attention to the matter of position, especially at the beginning of this series of lessons. Eye yourself closely, as it is not an easy task to rid oneself of habits that have been forming for years, whether they are good or bad.

Take a position at the table nearly square in front, with both arms resting on table, the left with the elbow on the table from two to four inches, the right with the elbow projecting over the edge about two inches. The right arm should rest lightly upon the table and be free to move in any direction, while the body is supported on the left arm. The sides of the paper should be placed parallel to the right forearm. The paper should be held with the left hand *above* line of writing. Do not lean too far forward or bend over your work, as such a position is injurious to health, but if your eyes are not defective keep them from twelve to fourteen inches from the paper. Sit rather close to the table, but do not lean against it. Keep the feet flat on the floor and see that they do not become entangled with the legs of the table or the rounds of the chair. After reading the above instructions several times compare with the illustrations, then assume this position yourself and be ready for work.

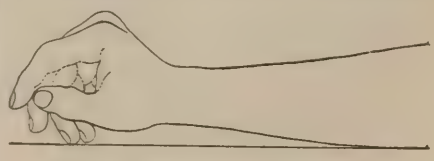
Movement.

Muscular movement is the foundation for all good, practical writing. Whatever may be said about slant or vertical writing, the system of penmanship that is not based upon free movement for its execution will be a failure if rapid business writing is desired. While a certain amount of form-teaching is commendable, still it is the arm-training that will be of service to the young man or woman in acquiring a rapid style of penmanship.

It is supposed that every one who takes up this series of lessons has a knowledge of the formation of all the capitals and small letters, although many write with a slow, laborious finger movement. It will be our aim to change the habit of writing these letters from the slow, labored style to one of ease and rapidity, with a few changes in the form of some letters. First allow the student to obtain a command of the pen, a control over the muscles of the arm, and he will naturally take enough interest in writing to improve in form also.

How to Begin.

You may now take the position of the hand and arm as shown in the illustration "2," without the use of the pen. By holding



CUT 2. POSITION OF HAND AND ARM.

the hand in the correct position before taking the pen an easy movement of the arm may

be secured. as well as the foundation for proper penholding. Rest the hand on the nails of the two last fingers, and make the same motion that will produce the first exercise in Plate II.

Practice rapidly, making not less than 150 pulls toward the body per minute. Next practice sliding the hand from left to right and from right to left across part of the page as shown in Plate I. being sure to maintain the same position throughout. The arm-rest near the elbow should remain in the same place; the arm at the elbow should act as a sort of a hinge. Remember, all of this preliminary practice should be done without pen and ink. This kind of calisthenic practice should be taken until the arm will move readily in any direction. It is better if you take up one thing at a time, and learn to do that in the very best way possible; hence we desire to have you learn to move your arm before using the pen. Do not be in any hurry to take up more advanced work, as your progress will not be satisfactory unless the fundamental exercises have been thoroughly mastered.

How to Proceed.

Penholding will not seem very difficult if you have practiced in the manner suggested, and with the hand held in the same position as illustrated in Cut 2. Do not use ink at first, but practice with a dry pen. Make the oblique exercise as given in Plate II. This is one of the most essential motions used in writing, and a great deal of time should be spent in practicing it. The exercise is made by keeping the sleeve stationary on the table, and forcing the arm to move in and out of the sleeve, using no finger action whatever. Arm down. Study Cut 1, as the dotted lines show the vibration of the arm. Make this exercise fill two large spaces; we call the distance between the two blue lines one large space. Make the oblique exercise just twice that size. After the movement has become established, then you may use ink, but if you find the movement degenerating, commence at the beginning and repeat the same practice as before. Next run the exercise across the page, and try to make it black. This should not be done by pressing heavily on the pen, but by making a series of light lines before moving toward the right.

The Lateral Exercises.

The ability to write a long word without lifting the pen is an accomplishment that will promote rapid writing. To accomplish this the lateral exercises and wide spacing between the letters and words should receive a good share of your time for several months.

Practice on the first lateral exercise given in Plate I. Place the arm about in the center of the exercise, lengthwise, and make the exercise extend about half way across the entire page. Do not allow the hand to turn toward the right, but keep it in the same position as illustrated in Cut 1. Force the hand to slide on the last two finger nails. Make a slight pause at the end of each exercise, and use a steady, swinging motion of the arm. Keep the fleshy part of the forearm down on the table and in about the same place. The tendency at first will be to use the wrist movement; be careful to avoid this, and see that the larger muscles are used.

How to Practice.

Do not practice longer than one hour at a time. The first part of the hour should be devoted to the practice of movement exercises, even after you are capable of making them well. This will insure freedom of motion and smooth lines. This movement practice is excellent as long as the arm is used as the propelling power. If the fingers are used to any extent, the value of the practice is practically lost. If your movement at this time takes in a wide scope, although difficult to govern, your efforts have been directed in the right channel.

Do not be easily satisfied with your work. Criticise your position, your movement, and your writing at all times. Do not omit any of the work. Although some of the exercises may seem distasteful to you, it is just the kind of work that you need, and you should master them if you wish to make the most of your possibilities. Improvement is only promised to those who faithfully follow every detail of the instruction as it is given in each lesson.

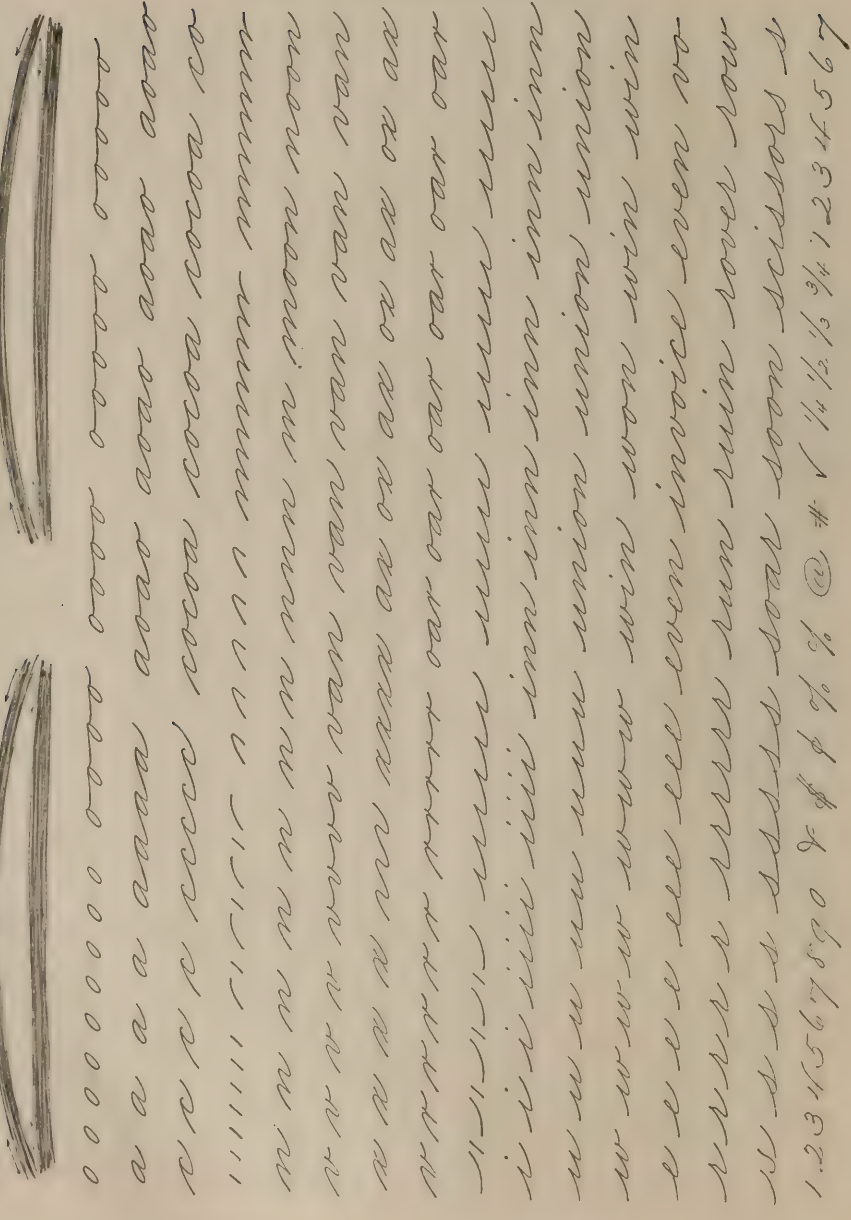


Plate I

CORRECT POSITION FOR THE PENMAN

The importance of a good position while writing cannot be overestimated, as it is the foundation upon which we build a substantial business style of writing. Many have learned to write an excellent hand while sitting in a poor position, but they certainly could have accomplished much more and with greater ease during the same time had they learned to sit in a better position. The author has tried to make these illustrations speak for themselves, and those desiring to improve their writing should study each illustration very carefully and follow directions given.

Plate II

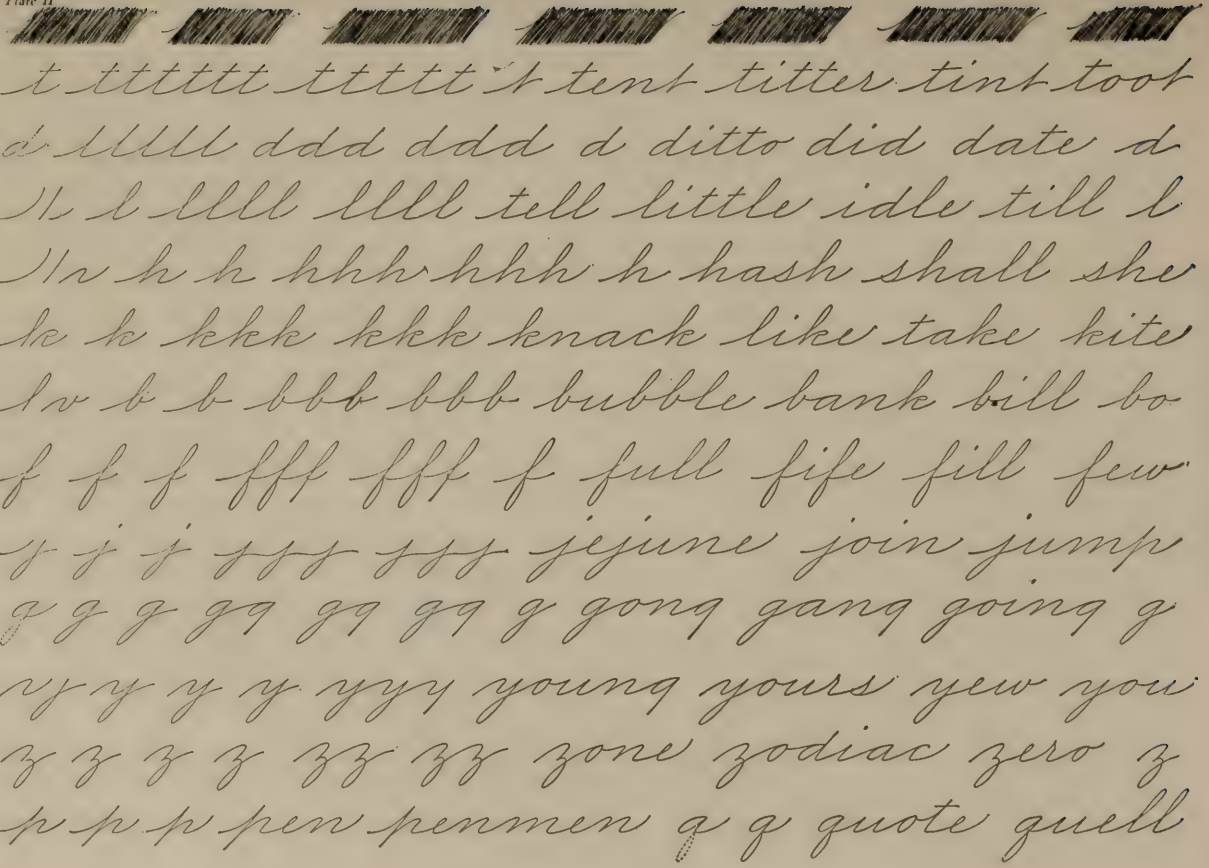
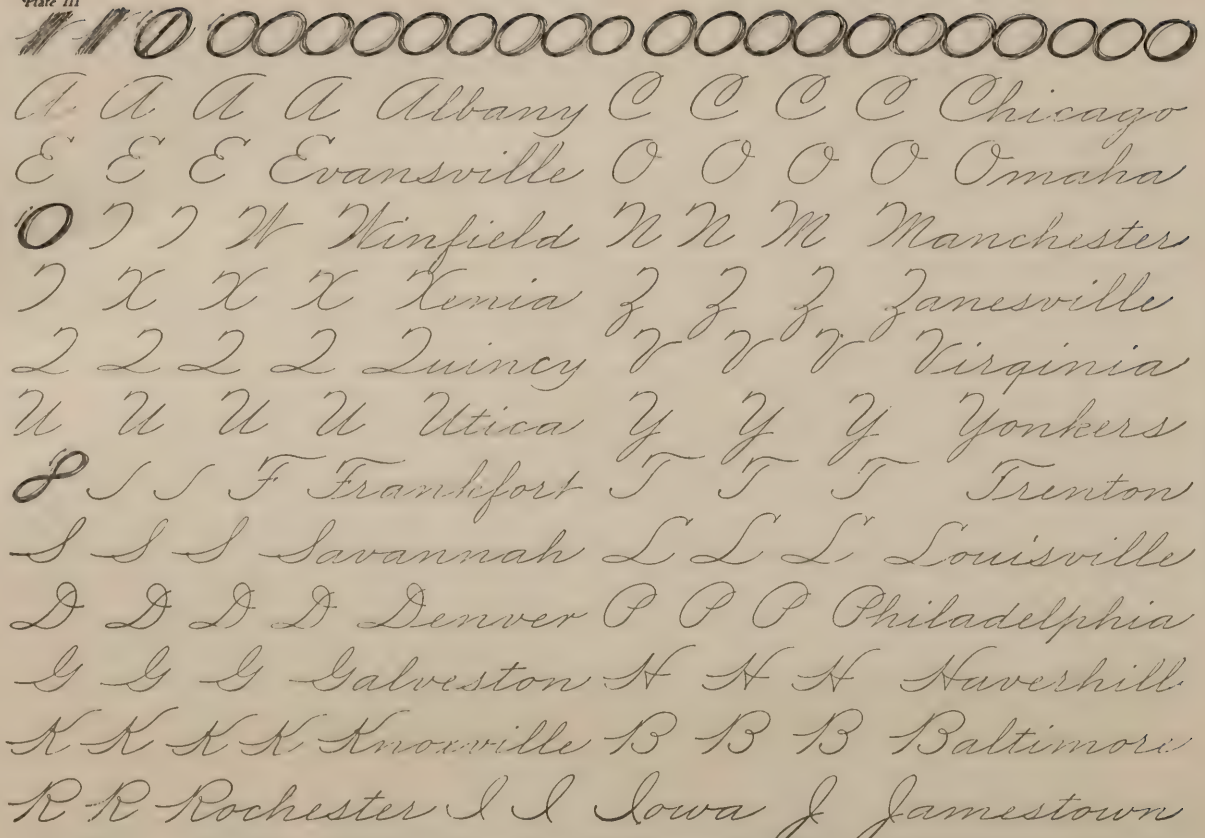

t ttttttt ttttttt t tent titter tint toot
d ddddd ddd ddd d ditto did date d
l l lllll llll tell little idle till l
h h h hhh hhh h hash shall she
k k kkk kkk knack like take kite
b b b bbb bbb bubble bank bill bo
f f f fff fff f full fife fill few
j j j jjj jjj jejune join jump
g g g gg gg gg g gong gang going g
y y y y yyy young yours yew you
z z z z zz zz zone zodiac zero z
p p p pen penmen q q quote quell

Plate III



MODEL COPIES FOR THE PENMAN

This plate and others of the series have been prepared especially for this work by Professor E. C. Mills, the expert penman and acknowledged authority on Penmanship. They give the necessary assistance for acquiring a beautiful style of penmanship. Full and complete instructions will be found in the text

Plate IV

Our recent war with Spain lasted nearly four months. Havana, Cuba.

Guam is one of our new possessions.

Pan-American Exposition, Buffalo, 1901.

The Peace Conference assembled at The Hague, Netherlands, May 18, 1899. Czar

Galveston Disaster, September 8, 1900.

Pekin, the capital of China, is nearly as large as our own city of Chicago.

Captain Gridley, when you are ready, fire. Dewey, May 1, 1898. Manila

"The Queen is dead, long live the King!

Plate V

Cash. Merchandise. Expense. Stock.
Loss & Gain. Interest & Discount.
Bills Payable. Bills Receivable. Cr.
Inventory. Nowells & Farnsworth. Dr.

Dr. **Cash** 1902.

				Mdse.	Gr	Sundries	
Jan.	4	16	Mdse. a/c Sales to W. J. Womac	15	82		
"	5	10	To amt. recd. of A. N. Metz, on a/c			96	10

Dr. **Langslow & Haines** Cr.

190-						190-					
Nov.	2	To Mdse.	17	74	40	Dec.	7	By Cash	18	60	—
"	5	" Sundries	9	86	25	"	9	" Mdse.	20	50	—

Plate VI

Opening a Business Letter.

Philadelphia, Pa., Oct. 4, 1901.

Messrs. Cameron & Co.
Galesburg, Ill.

Gentlemen: Yours of the 1st. inst. re-

Closing a Business Letter.

Hoping to hear from you soon, I remain,
Yours truly,
Isaac T. Johnson.

Opening a Social Letter.

Cedar Rapids, Ia., Nov. 9, 1903.

My dear Friend.
Your letter announcing your marriage to Mr. C.

Closing a Social Letter.

Believe me, my dear friend,
Ever, your loving
Grace.

Letter of Application for a Position.

Plate VII

Rochester, N. Y. Jan. 10, 1904.

Manager 190, World Office.
New York City.

Dear Sir,- I find the above advertisement in to-day's "World." I can meet all the requirements and believe I should enter, with enthusiasm, upon the work offered.

I can give the very best of references as to my character and ability.

Awaiting your reply, I remain,

Yours truly,

C. T. Howard.

Plate VIII

Form of Receipt.

$ 500.00

New York, Dec. 30, 190—

Received of Edward C. Mills

Five Hundred —— 00/100 DOLLARS

In full to date

No. 46 Wm. Haines

Form of Company or Firm Note.

$ 500.00

Boston, Mass., May 10 190

Thirty days after date we promise to pay to the order of Howard & Brown

Five Hundred 00/100 Dollars

at City Bank

Value received

No. 410 Due June 9 Clarkson & Avery

C.E. Morris, Stationer, Rochester, N.Y.

Form of Draft.

$ 4000.00 Rochester, N.Y. Sept. 17, 190

At sight Pay to

the order of John B. Goff

Four Thousand 00/100 Dollars

Value received, and charge the same to account of

To A. N. Martin, No. 50 117 North St. N.Y.

Gaskell & Jones

CDT. NY 8200

Vertical Writing.

A B C D E F G H I J K L M N O P Q R S
T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0 $ ¢ % % # @ √ ½ ⅓ ¼ ¾ ? ! 1 2 3 4 5 6 7 8 9 0

"Silver and gold are not the only coin: virtue too passes current all over the world."

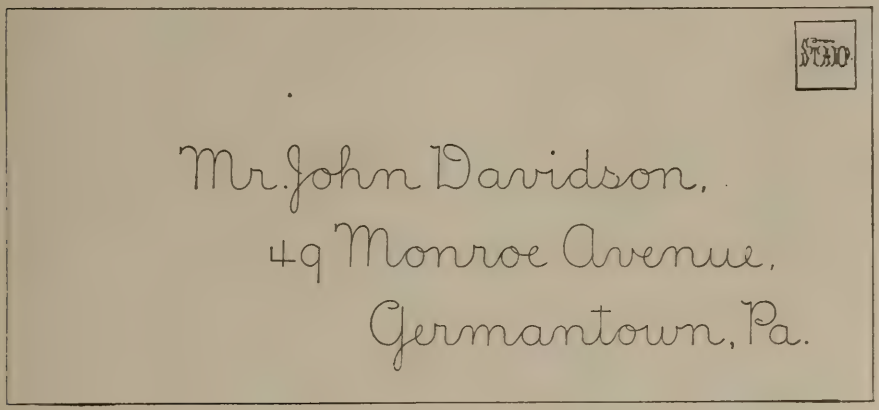
"No form of Nature is inferior to Art; for the arts merely imitate natural forms."

PASTEUR IN HIS LABORATORY

The discovery of the mission of the exceedingly minute organisms known as bacteria in producing disease ranks among the greatest and most beneficient of our age. By it the art of the physician was first raised to the rank of a science. The honor of this discovery belongs to Louis Pasteur, the eminent French chemist and biologist

Plate X

Mr. and Mrs. Edward Rhoads request the pleasure of Mr. and Mrs. John Davidson's company at dinner, Wednesday evening, at eight o'clock. January eighth, 1903.



Mr. John Davidson,
49 Monroe Avenue,
Germantown, Pa.

"Resolved, that the Whittier Literary Society extend its sympathy and condolence to the family of our late member, Thomas Wentworth Higginson."

Instruction for Plate I.

A great deal of time should be spent in practicing the one space letters. The different parts of each letter are illustrated in such a way that any one can see just how each letter is formed. Practice the different principles that are given for the letter, then practice on the letter itself, and after that the combination of letters as shown in the word copies or groups. The figures and commercial abbreviations should be practiced carefully. First, study the form, get a clear conception of the formation of the letter or figure, and then write with a free movement. There is a tendency sometimes with beginners in wanting to slight some of the first work in order that more difficult copies may be taken up. Be careful to work patiently on these small letters, as they are the foundation for good, practical writing. After the principle are practiced, then write a page of each letter, and follow with a page of each word containing that letter. In writing the page of word copies, see that the writing is not spread out too much, or that too wide spacing is left between words. After the proper spacing has been decided upon, see that you write the same number of words throughout the entire page.

Instruction for Plate II.

In this plate we have the loop letters. Loop letters are easily made if the right motion is used in producing them. In the formation of the loop we find the right curve and the straight line. For exercise work we have given the oblique movement exercise. Make this exercise fill one large space in height. Take up the letters and words in exactly the same order in which they are given. Do not omit or hurry over any part of this work.

One of the principal faults in forming the loop is in making the first line too straight. It should be quite a decided curve, then make the downward line practically straight. The two lines should cross about one-third the height of the loop, and be careful not to make them too long. Perhaps a little finger action would help you in making these, but let the main motion come from the arm.

Unless you can write all the one space letters as found in Plate I with the muscular movement, you will have a very poor foundation upon which to build loop letters. In your loop letters some space should be left between the top of the loop and the blue line above. If any letter or word seems very difficult, that is the one you should practice on most.

Instruction for Plate III.

In Plate III all the capital letters are presented, and they should be practiced in the order in which they are given. First practice on the movement exercises and then gradually take up one letter at a time. At least one page should be filled with each word copy. The work grows more difficult as we advance, therefore will be seen the necessity for the thorough working of the preliminary exercises before trying to make these capital letters. Do not sacrifice the movement for form; for, while you may gain some in form, you will lose in movement, without which your writing is poor indeed. After having practiced all of the work given in this plate, it is a good plan to return to some of the letters and review them. Select several of the most difficult capitals and aim to make the greatest improvement possible in those letters. Compare your work with the copy often and see that precisely the same forms of letters are used that are given in the copies. It is better to have but one style of capital letter and practice that so thoroughly that the work becomes almost automatic. You will scatter your forces too much if you try a number of optional forms in capital letters. In giving these letters for practice we have selected the very plainest forms and those that are used most frequently by business men and good business writers everywhere.

As soon as one letter is learned you should make a practical application of that form in all of your everyday writing.

Instruction for Plate IV.

There are many who can make a word or a line appear to advantage, but when it comes to a page of miscellaneous work, there is something lacking. The remedy for this is the practice of miscellaneous page

work, and we hope our home students will write the work given in Plate IV over many times. There are no new capitals in this, and it will serve as an excellent copy for this class of work. Study the arrangement of your work and be sure to write with the free-arm movement. Avoid every tendency to shade or flourish, and endeavor to cultivate neatness and order in all your practice work. We believe the copies presented contain educational value aside from the practice of penmanship, and we can make our practice doubly valuable by taking up only such copies as contain important statements.

Instruction for Plate V.

The copies in this plate are such as will help those who have occasion to do work in bookkeeping. The first four lines of copies are intended to furnish material for the practice of ledger headings. The writing is made somewhat larger than that used for ordinary correspondence work, as the main thing in ledger headings is to have the work plain and legible in the extreme. Some accountants prefer to shade their ledger headings, and several examples of this kind of shaded writings are given on this plate which will show how this work is done. It requires more skill to do shading and have the work look well, and this should only be attempted by those who are quite proficient in using the pen. The writing used for explanations in bookkeeping entries should always be quite small and should never be shaded nor flourished.

Instructions for Plates VI. and VII.

In letter-writing great care should be taken that the style of writing be perfectly plain. Too much care cannot be taken in writing signatures, as often very good penmen will write their name in such a way that it is difficult to read them. Many presume that their signature is so familiar to the general public that they finish the otherwise well-written letter carelessly in that respect. Do not sign your name with flourishes, but endeavor to use the plain forms that have been given throughout the series of lessons. These forms, in Plates VI and VII, offer excellent models for practice in letter writing, and be sure that you follow the arrangement in every respect. After practicing on these models you may make a little variation in the subject-matter and sign your own name, and in that way you will get practice that will be very beneficial to you when it comes to actual letter-writing. The only way to make a success of your handwriting is to use good writing in your everyday work.

Instruction for Plate VIII.

These forms will give you an idea how to apply good penmanship in connection with business forms. If you have blank forms similar to the ones presented herewith, you may fill them out in order to get the proper size of writing and correct arrangement of the work. Follow these copies in every particular, as they are based upon up-to-date models of business forms.

Instruction for Plates IX.–X.—Vertical Writing.

As vertical writing has been very popular in different sections of the country during the past few years, it has been thought advisable to give also instruction and practice in this style of writing.

Position for Vertical Writing.

The position for vertical writing differs somewhat from the position advised for slant writing. Notice the square front position and also that about half or three-fourths of both forearms are on the desk and that the elbows are kept quite close to the body. The paper should be held directly straight in front of the body in order that the lower edge of the paper may be held parallel to the edge of the desk. The penholder should point in the direction of the elbow, and, as will be noticed, the hand is turned more to the right than in the slant writing. The wrist should neither be flat nor turned to the right until the side of the hand touches the paper, but about half way between these two positions. Do not try to slide the hand on the tips of nails of third and fourth fingers, as this forces the hand in an upright position which makes it impossible for the student to see his own writing.

Many try to write the vertical without any change in penholding, movement, or position of the paper. Experience has shown that the results will not be satisfactory unless the change is made, so we urge that all should conform as near as possible to the position illustrated herewith.

POSITION FOR VERTICAL WRITING.

How to Produce Vertical Writing.

To produce the straight downward stroke in vertical writing, draw the pen toward the body, rolling the forearm on the muscles. To make the broad turns between the letters, roll or pull the arm back into the sleeve and to the right at the same time. As the arm should rest lightly on the desk, it may slide very much the same as the third and fourth fingers do. This, of course, cannot be done if the weight of the body is thrown forward on the arms.

Speed in Writing.

After the student has a good knowledge of form and can write all the letters with a reasonable degree of speed, it has been found advisable to practice on copies for speed work alone. Take a sentence-copy and let the student time his writing by the watch. Each time the sentence is written he should endeavor to increase in speed a little and at the same time get good form to the letters.

Patience and Perseverance in Writing.

The home student in learning to write should develop patience, and in order to secure an acceptable business hand must learn perseverance. These are two very essential qualities for success in writing. Many pupils in starting their practice on this series of lessons will perhaps write a few words of one copy and then a few words of another; perhaps they will practice a little on the movement exercises and then think that it is about time that some substantial improvement should show itself. The first few weeks of practice may tend to discourage the pupil as many write with a slow, cramped finger movement, and when the change is made to the free movement considerable is lost in form. Many give up in despair when they see that their writing is not improving perceptibly in form from the start. There will be an improvement, however, in the freedom of movement, if the instructions are faithfully followed; this is absolutely essential in learning to write a good business hand. That is the time to be encouraged, as the manner of writing is being changed, and it is right here at this critical time that the pupil must learn patience and must be persevering in his work. A few fitful hours of practice will benefit the writing but very little, in fact, it is worse than no practice at all. A definite plan should be followed as nearly as possible, and adhered to very closely if the student expects to improve the condition of his writing. From thirty to forty-five minutes a day should be spent in the practice of writing until a good business hand has been attained.

The student should remember that a good handwriting is worth hundreds of dollars to its possessor, and that nothing valuable in education was ever achieved without hard labor and many disappointments. Be patient, be persevering, work hard, and a good style of writing will be the result.

MONEY AND BUSINESS

THE COMMON MEDIUM OF EXCHANGE—MANY KINDS OF MONEY—MONEY OF ALL COUNTRIES—DIFFERENCES IN VALUES—BANKS AND BANK FORMS—HOW MONEY IS TRANSFERRED—RULES GOVERNING BUSINESS TRANSACTIONS —FORMS USED IN BUSINESS

WHAT IS MONEY

Francis A. Walker, a distinguished authority, defines money as "that which passes freely from hand to hand throughout the community in final discharge of debts and full payment for commodities, being accepted equally without reference to the character or credit of the person who offers it and without the intention of the person who receives it to consume it or enjoy it or apply it to any other use than in turn to tender it to others in discharge of debts or payment for commodities." *Currency* is the name given to the legal medium of exchange in every country.

Various articles have passed current as money in various communities at different times. *Tobacco* was used as money by the early Virginia settlers; the skins of fur-bearing animals served the same purpose in some parts of this country at a much later date. For ages gold and silver have been the first choice of all nations as the standards of value. Some one has truly said, 'Abraham, 1900 years before Christ, weighed out uncoined silver in payment for land, and 1900 years after Christ gold-dust passed current as money among the 'forty-niners' in California." The standard of monetary value of the civilized nations of the world is a fixed amount of gold or of silver, which, taken together, is called bullion.

Gold and Silver Money.

In the United States the *dollar* is the unit of value, and is equal to 23.22 grains of pure gold. Therefore, when we say that an article is worth so many dollars we mean it is worth so many times as much as 23.22 grains of pure gold.

The gold coins of the United States actually contain the gold in the proportion of 900 parts gold and 100 parts alloy, and are the only form of money actually worth its face value as a commodity; therefore gold is the only money that will be accepted in a foreign country at par. The gold coins of the United States are the 20-dollar piece or double eagle, the 10-dollar piece or eagle, the 5-dollar piece or half eagle, the 3-dollar piece, the 2½-dollar piece or quarter eagle, and the gold dollar, which has not been coined since 1890 and which is now not much in circulation but considered rare.

An estimate has been made showing there is about $7,000,000,000 in gold in use in the world, and this, if put into one place, would fill a room 64 feet long, 50 feet wide,

and 20 feet high. In the banks and treasuries gold coin are piled in bags each containing $5000 and weighing 22 pounds.

The silver dollar weighs 412½ grains, of which 371¼ grains is pure silver and 41.25 grains alloy. This amount of pure silver was at one time equal in value with 23.22 grains of pure gold. Of late years it has been much cheaper, and its relative value to gold is no longer 16 to 1, being determined by commercial conditions.

The half dollar, quarter dollar and dime, as well as the 5-cent nickel and the copper cent, contain still smaller proportions of silver, and are intended only for circulation in this country as representatives of the fractional parts of a dollar. They are legal tender for debts not exceeding five dollars in amount.

The standard of value are the gold coins, which stand upon their own merits as actually worth what they represent on their face. All other coins only *represent* their face value, being accepted throughout the land because they are by law exchangeable for the amounts for which they stand.

Paper Money

There is another medium of exchange not having any value in itself, but representing the credit of the government. It is, in fact, a form of "promise to pay," and for that reason it is often called "fiat money" or "paper money." Paper money is largely in use in this country, and is represented by four different kinds. The first and second are called respectively *Gold Certificates* and *Silver Certificates*. These are issued by the Treasury, and represent on their face the number of gold or silver dollars held in the Treasury of the United States payable on demand to bearer. These certificates are popular on account of their convenience, and are always worth par. The third kind is the *Treasury note* or *greenback*, which is a promise to pay the bearer on demand (therefore a demand note) without interest. There are now in circulation $300,000,000 of Treasury notes. This was called into existence during the Civil War, and for a time was not worth par in gold. Now it is worth par, as the credit of the government insures their payment.

The fourth class is the *National Bank note*, issued by banks holding a charter from the United States, and whose circulation is secured by United States bonds deposited with the Treasurer of the United States. The payment of these notes is guaranteed by the United States Government.

Gold certificates are issued in denominations of $20 and upwards.

The Silver certificates in $1, $2, $5 and upwards, to $10,000.

The Treasury notes in $1, $2, etc., to $10,000.

The National Bank notes are issued in denominations of $5 and upwards.

Money of the British Empire.

Great Britain in actual circulation has the gold sovereign (value $4.8665) and half-sovereign; the silver crown (value $1.087), half-crown, shilling (value $0.217), six-pence, four-pence, and three-pence. It has a paper currency, which includes the notes of the Bank of England, the smallest denomination of which is five pounds; the notes of the Scotch and Irish banks, the smallest denomination of which is one pound. Certain joint stock and private banks also issue notes.

CANADA has a currency similar in form to that of the United States. But she has no gold coinage of her own. She uses the gold coinage of the United States and Great Britain, and they are legal tender. The silver coins are similar to those of the United States except that there are no silver dollars and no silver five-cent pieces. There are notes issued under the laws of the Dominion of the denominations of $1, $2, and $4, and are redeemable in gold on demand. The chartered banks issue bank notes in denominations not smaller than $5. Unlike the laws in the United States, no special security in the way of deposit of bonds is required, but the notes, in case of the bank's insolvency, become a preferred claim against all assets of the bank, and include the double liability of the stockholders. The total issue rarely exceeds sixty per cent. of the paid-up capital of the bank, and in no case must it exceed one hundred per cent.

AUSTRALIA has the same monetary system as that of Great Britain.

BRITISH INDIA has a silver standard unit, which is the rupee, whose value is $0.444. It has gold coin of five, ten, fifteen, and twenty rupees, respectively. The government notes, ranging in value from five to ten thousand rupees, are issued and secured by deposits of gold and silver. The money in circulation in India is said to exceed one billion dollars.

Money in Foreign Lands.

GERMANY has a gold standard, and the mark, whose value is $0.208, is the unit of value. The 5-mark piece is the smallest gold coin. The 5-mark, 2-mark, 1-mark, ½-mark, and ¼-mark pieces are the silver coins. Germany has a paper money which includes the imperial treasury notes, and the bank notes of the Reichsbank, a corporation owned by individual shareholders, but controlled by the government. The issue of notes of less than 100 marks in value is prohibited.

AUSTRIA-HUNGARY has recently established a monetary system making as the unit the gold crown, whose value is $0.203. The 10-crown and 20-crown pieces are in gold, and the crown and a half-crown pieces are in silver. However, there is very little metallic money in circulation. There is a paper currency issued by the Austro-Hungarian Bank in denominations of 10, 100, and 1,000 florins, and by the treasury in smaller denominations—this money is redeemable. The value of the florin is two crowns, or about forty cents.

THE LATIN UNION, including France, Belgium, Italy, Switzerland, and Greece, has now a single gold standard, of which the franc, whose value is $0.1929, or nearly twenty cents, is the unit of value. The smallest gold coin is a 5-franc piece, equivalent to a dollar; in silver are the franc, the 2-franc, the half-franc, and the 20-centimes. The latter is one-fifth of a franc, or four cents. The coins of one country of the Union are received at par in all the others. France and Belgium have state banks which issue bank notes. In Belgium, individuals and associations are also free to issue bank notes on their own responsibility. Italy has no state bank, but there are in the country six banks which are authorized to issue notes payable on demand. The smallest denomination is 50-lire, in value, about 19 or 20 cents. Switzerland uses the coin of the Latin Union, and also has a state bank. Its central office is at Berne, and there are branches throughout the country.

IN GREECE there are three banks authorized to issue notes. But gold and silver reserves are so small that for many years gold has been at a premium.

IN SPAIN the silver peseta, equivalent to the franc, or twenty cents in our money, is the monetary unit. The gold and silver coins are the same in Spain as the other countries of the Latin Union. The Bank of Spain is the only bank of issue in the country. It is a private institution, with certain government restrictions. The smallest note of issue has the value of 25-pesetas, in our money equal to nearly five dollars.

IN MEXICO there is a silver standard. The unit is the Mexican dollar, called el peso; and, under the name of piaster, it circulates in several countries in Central and South America, Asia, and Africa. Mexico has also a few gold coins in circulation, the smallest is equivalent to our gold dollar in value.

Banks and Banking.

Banks, both national and private, offer another means of exchange. Any one having money deposited in a bank to his credit may give to a third party an order on the bank for any number of dollars and cents not exceeding the full amount of his credit. These orders on the banks are called *Bank Checks*. They differ from paper money, as their acceptance depends upon the credit of the one who draws (or signs) the check. It is usually made payable "to the order of" some one. The party presenting the check must be known in some way to the bank authorities.

The use of checks adds to the circulating medium, and is a benefit to the community at large. It leaves actual money for minor transactions. They are in far more extensive use than any other form of money order. Checks often pass from

hand to hand as money before they reach the bank, and then are seldom cashed—usually deposited. Over a hundred million dollars of checks daily in New York alone are not cashed at the paying teller's window, but pass in "exchanges" through the Clearing House, which is an association of the banks of a large city for the purpose of conveniently and quickly transferring checks they hold for collection. This saves an immense amount of time and labor, which would otherwise be spent in handling and counting the money, and also lessens the chances for mistakes.

Utility of Bank Accounts.

This leads us to consider the advantages of keeping an account at bank.

(1) There is the safe keeping of the money, and protection from loss by burglary. (2) It is an easy way of collecting. If the business man were obliged to send his messengers to various parts of the city or neighboring towns to collect the cash for the various checks, drafts and money orders he received, a great deal of his time would be taken. When he deposits the checks and drafts the bank does the collecting for him. The bank also collects for him such drafts as he may draw upon his debtors in distant places, charging only a small fee for the service, and sometimes without charge.

(3) It offers facilities for making payments and for saving of time in handling and counting out large amounts in bills and coin, and lessens the risk of loss by mistakes.

The merchant who keeps an account at a bank, establishes an acquaintance with the institution, and is able to borrow money by borrowing upon his notes when needed. The lending of money by discounting notes, etc., is a prominent part of the business of a bank, yet there are times when the bank will discount only for its own depositors with whose character and responsibility it is well acquainted.

How to Open an Account at Bank.

A bank will not open an account with any one who may desire it. The depositor is expected to obtain an introduction to the officers of the bank by some one who is well known to them, and to satisfy them that he is a person of proper character and responsibility. In the interview with the cashier he will be asked questions which may be answered in confidence, to satisfy the cashier of his business habits. The depositor then writes his name (just as he will sign his checks) in the "Signature Book," so that the bank may guard against forgery. The depositor then makes his first deposit, and the receiving teller gives him a pass book, with the amount entered therein.

DEPOSITED AT THE

Hanover National Bank

February 15, 1901.

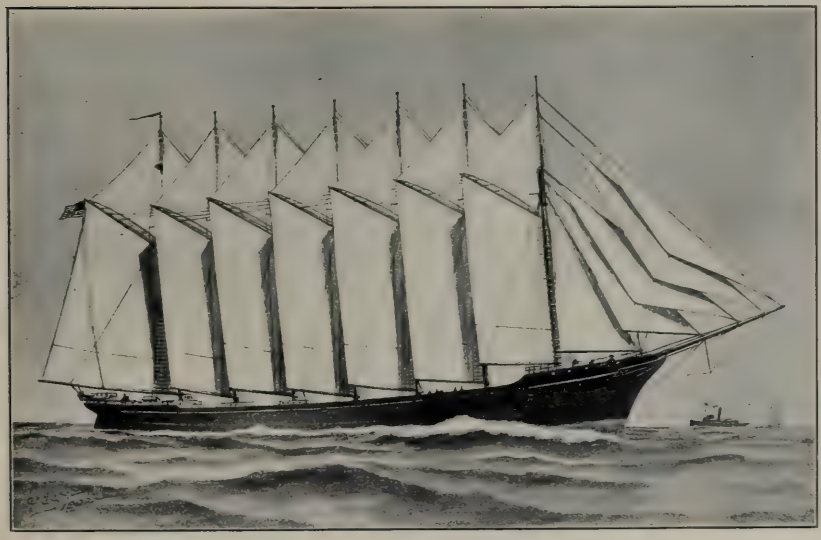
By *John S. Vansandt*

	DOLLARS	CENTS
BANK NOTES, ...	125	
" " 1's and 2's .	13	
SILVER, ...	15	50
GOLD, ...	20	
CHECKS, ... In New York, name the Bank; out of Town, name the Place. *Please Enter Separately.*		
Chemical National	43	75
First National	18	25
Pittsburg, Pa.	115	21
Columbus, O.	75	19
Toledo, O.	84	
Total, . .	509	90

THE DEPOSIT SLIP.—Whenever a deposit is made the depositor fills out a deposit slip, furnished by the bank, to be retained by the receiving teller and by him given to the bookkeeper. The above is one form of a Deposit Slip.

THE GREYHOUND OF THE SEA

One of the latest, newest and swiftest of passenger steamers which ply between America and Europe. This beautiful boat is 587½ feet long, 12,200 registered tons and 8,000 horse power. It has reduced the time for the voyage across the Atlantic to 5 days.



THE FREIGHT TRAIN OF THE OCEAN

The seven masted Schooner "Thomas W. Lawson" launched July 10, 1902. Length over all, 395 feet; length on load water line, 388 feet; molded beam, 50 feet; depth from top of keel plate to top of upper deck beam, 34 feet, 5 inches; draught to load water line, 25½ feet. Its carrying capacity is more than 8,000 tons of coal.

CHECKS.—A *Check* is a written demand, which is addressed to a bank by a person who has money deposited therein for the payment of a part or the whole of his money to a third party.

The Heading, the Order to pay, the Amount Repeated in figures, the Signature, and the Number of the check are the parts of a check.

The *Heading* of the check is in all respects the same as that of a letter, and includes address and date.

The *Order* is written beneath the heading and fills the line for the full length of the check, and usually occupies three lines. The name of the bank, printed in bold type, is on the first line; on the second are the printed words *Pay to*, which are followed by the name of the person to whom the payment is to be made, or the *payee*. On the third is written the amount to be paid, the number of dollars to be paid being indicated in script, and the number of cents, in figures as a fraction of a dollar. It is optional whether the word *and* be used between the dollars and the cents. The line generally ends with the printed word *Dollars*.

Begin with capitals the words *Pay* and *Dollars*, and all important words in the name of the bank, as well as all words expressing numbers, except such as may be connected with preceding words by the hyphen.

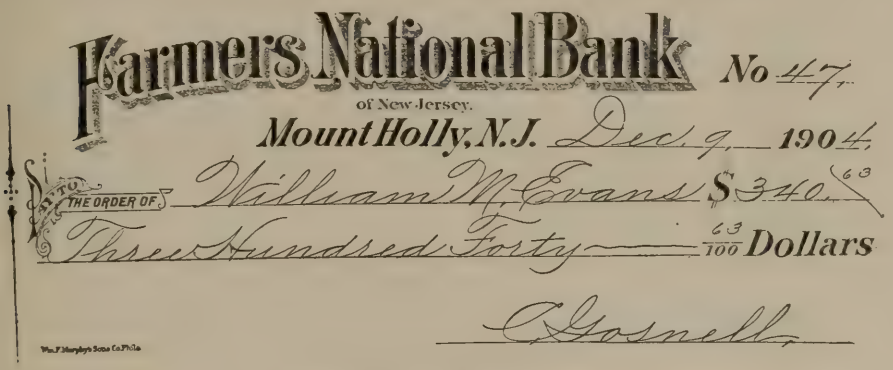
The *Amount Repeated* is in figures, the same in amount as mentioned in the order. But it is sometimes written in the body of the order with the script statement and sometimes in the upper left-hand corner of the check on a line with the heading. It is placed in the lower left-hand corner on a line with the signature.

The cents are expressed fractionally, as in the body of the order.

Most business men number their checks in the order they are issued. The number is found in one of the corners which is not occupied by the value of the check written in figures.

How to Draw a Check.

Checks are principally of two kinds: Negotiable and Non-negotiable.



CORRECT FORM FOR CHECK

A *Negotiable Check* is one that may be transferred from one person to another, and a *Non-negotiable Check* is one that cannot be so transferred.

In drawing a negotiable check the order may be in one of the following forms: Pay to Bearer; Pay to the order of So-and-so; Pay to So-and-so or order. The first makes the money payable to any one that may present the check. The second or third makes the money payable to any person to whom the payee may order it paid.

When the word *Bearer* is used, the check is negotiable as it stands; but when the word *order* is used, the payee can neither collect the money himself nor transfer the check to another without writing his name

upon the back. This is called indorsing the check. When the payee writes his name only, he is said to indorse the check in blank. By this indorsement he makes the money payable to bearer, and the check is still negotiable. When the payee wishes the money paid to a particular person only, he writes on the back *Pay to So-and-so*, and signs his name beneath. With such an indorsement the check is no longer negotiable. But when the payee wishes to transfer the check to another, so that it can be transferred to still another, he writes on the back *Pay to the order of So-and-so*, or, *Pay to So-and-so or order*, and signs his own name beneath this. The check is now also negotiable. This may be repeated by the second person and so on, by indorsing it back of the check and about one inch from the top:

FOR DEPOSIT TO CREDIT OF
Herbert Smith
OR
FOR DEPOSIT ONLY
IN HANOVER NATIONAL BANK
FOR CREDIT OF
Herbert Smith

The *left* end of the face of the check is the *top* of the back. Any person named for the purpose may sign an indorsement for deposit. Checks thus indorsed can only be deposited, and should they be lost on the

No. 974		*No. 974*	*Wilmington, Del., Feb. 15, 1901*
Feb. 15, 1901		**FIRST NATIONAL BANK OF WILMINGTON**	
To P. S. James		*Pay to the order of Peter S. James*	*$94 25/100*
Rent for Feb., 1901		*Ninety-four 25/100*	*Dollars.*
	94 25		*William G. Pollock*

The Check Stub and Check showing how record is kept in check book

under the other indorsements. The *Holder* is the person who is in legal possession of a check.

How to Indorse Checks.

For indorsement, first turn the check so as to bring the left end to the top, and then turn it face downwards and write the indorsement near the top. Each successive indorsement should be written under its predecessor.

Checks are usually bound in books. At the left of each check so bound, and on the same piece of paper, is a ruled form for a complete description of the check. Between the check and this ruled form there is a line of perforations by means of which the check can be torn off for use. The paper that remains behind is called the *stub*.

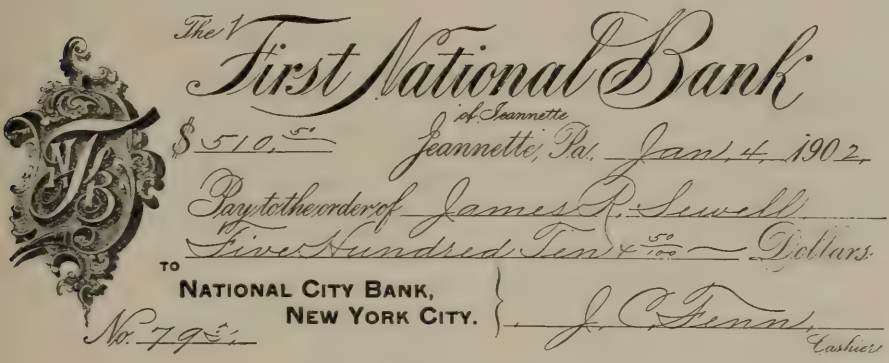
Before depositing the checks they must first be indorsed. The customary form of indorsement is to write or stamp across the way to the bank the finder cannot use them, because as stated the checks are to be deposited, and the bank is not authorized to pay them to any one.

If the holder receives a check in which his name is incorrectly written, he must first indorse the name as it is written and under that write his own name correctly. When the deposit slip has been made out, it is well to keep a copy upon the reverse side of the stub of the check book. The checks, money, deposit slip and pass book are then taken to the receiving teller, who examines the deposit slip to see that it is correct and enters the amount in the pass book. This entry is his receipt for the amount deposited.

It is of the highest importance that the depositor keep his check book correctly and punctually written up. It is his guide to his bank account and he should be able to tell at once exactly how much money he has in bank at any given time.

When to Balance Pass Books.

At short intervals, the pass book should be left at the bank for settlement. The bookkeeper will enter, on the page opposite the deposits, the amounts of the checks that have been paid by the bank, and bring down the balance to depositor's credit in the bank at that time. When the pass book is returned compare the stubs in the check book and bank book at the date of settlement. If the bank book and check book do not agree, check off the deposits entered in the bank book with those in the check book; if the difference is not found, try the additions and subtractions in the check book. The bank book may show a larger balance than the check book on a certain date. This may show that some check or checks given out by you, and subtracted in the check book, have not yet been presented at bank for payment. To find the bank's balance add the amount of the check or checks to the check book balance. If this prove correct let the check book balance remain as it is, for that is really the amount there is in bank to be checked against.



A CASHIER'S CHECK

Checks are Good Receipts.

It is evident that money is placed in a bank for safe-keeping, and that the bank becomes responsible for it. Therefore no part of it will be paid out without a check or written order of the depositor. When these checks are returned to the depositor and his pass book balanced, the bank is released from responsibility to that amount.

It is evident also that a check given in payment for goods or for any obligation becomes a receipt to the one who drew it; for the person in whose favor it was drawn by writing his name on the back of the check acknowledges the receipt of the money. Some persons state on the face of the check "in payment for"; but this is not good form, nor does it stand in law for more than the plain check. The checks cancelled at the bank stand as the bank's receipts or vouchers for depositor's money when returned to him or to his order.

If the drawer fails to take ordinary precautions to protect his checks from being "raised" or changed, the loss falls upon him should the bank pay the check for wrong amount.

Write your signature without flourishes and as nearly as possible like the specimen left at the bank when you opened your account. It is always desirable to write your first name rather than initial.

How Checks are Certified.

In many transactions, involving the transfer of a large amount of valuable property for cash, an ordinary check is not satisfactory to the person who is parting with his property, for he is not sure that his check will be honored when presented, however good the standing of

the drawer may be. Therefore the check may be presented to the paying teller or cashier of the bank on which the check has been drawn, who, after finding that the amount is still to drawer's credit, writes or stamps across its face the words, "Good when properly indorsed," or "certified," and signs his name. The amount of the check is at once charged to drawer's account, and is the same as cash withdrawn. The certification of checks is largely practiced in large business centres, as in Wall Street, New York, where the daily sales of stocks and bonds run up into the millions, and failures caused by fluctuation in prices often come with startling rapidity. A check which may be good to-day, to-morrow may be worthless.

When a check has been lost, in the mails or otherwise, stolen, or given in mistake, the payment of the same may be stopped by the drawer at any time before it is presented at bank. Parties holding such a check honestly, and for value given, may have recourse to law for collection of same.

Drafts and Bills of Exchange.

A draft, or bill of exchange, is, in fact, a letter written by one person to another living in a different place, requesting him to pay a sum of money to the order of the drawer or to a third person. Commercial usage recognizes particular forms for writing these drafts.

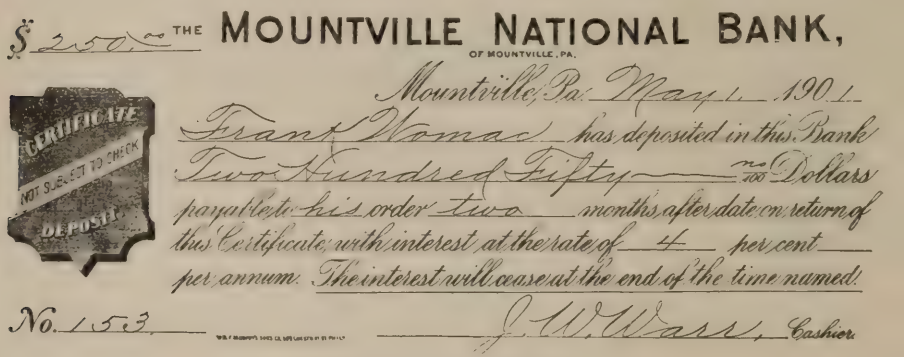
There are two kinds of bills of exchange, Domestic and Foreign.

Domestic Bills of Exchange are payable in the same country in which they are drawn, and are commonly called *Drafts*.

Foreign Bills of Exchange are payable in another country from that in which they are drawn, and are called *Foreign Drafts*.

The parts of a bill of exchange are the *Heading*, the *Order*, the *Repeated Amount*, the *Signature*, and the *Address*.

The first four of these parts correspond, respectively, in position, arrangement, capitalization, and punctuation to the heading, the promise, the repeated amount, and the signature of a check or promissory note.


$ 250.00
THE MOUNTVILLE NATIONAL BANK,
OF MOUNTVILLE, PA.
CERTIFICATE
NOT SUBJECT TO CHECK
DEPOSIT
Mountville, Pa. May 1 1901
Frank Womac has deposited in this Bank
Two Hundred Fifty 00/100 Dollars
payable to his order two months after date on return of
this Certificate, with interest at the rate of 4 per cent
per annum. The interest will cease at the end of the time named.
No. 153
J. W. Wass, Cashier

CERTIFICATE OF DEPOSIT

The *Address*, preceded by the word *To*, is begun either on the same line as the signature, or on the next line, but as far to the left as possible. It usually includes both name and location, each of which occupies a line by itself.

The person who signs a bill of exchange (or draft) is called the *Drawer* or *Maker;* the one to whom it is addressed, the *Drawee;* the one to whom it is made payable, the *Payee;* and the person who is in legal possession of it, the *Holder*.

Bills of exchange, like notes and checks, are either *negotiable* or *non-negotiable*, according as they are payable to the order of a person or simply to the person himself. The former are the more common.

A *Sight Draft* is one payable at sight; that is, on presentation.

257\frac{00}{100}$. Savannah, Ga., March 29, 1901.

At sight, pay to the order of Booker Washington, Two Hundred Fifty-seven Dollars, value received, and charge to our account.

George P. Richards & Co.

To Theodore P. Thomas & Co.,
New York City.

A *Time Draft* is one made payable a certain specified length of time after sight or after date.

469\frac{00}{100}$. Mobile, Ala., March 1, 1901.

Thirty days after date, pay to the order of Sylvester Cutler, Four Hundred Sixty-nine Dollars, and charge to the account of

John G. Cannon.

To J. B. Smith & Co.,
Phila., Pa.

Foreign bills of exchange are usually made in sets of three, which are alike in all respects except their designations of *first*, *second*, and *third*. The three bills are usually sent by different mails, and whichever arrives first is used. The others are then worthless. These bills differ from ordinary drafts, by the insertion in each, of the condition that it is to be paid if the other two of the set are unpaid.

Drafts are sent through banks, and not through the mails, and are used to avoid the risk, inconvenience, and expense of sending actual money from one place to another. The principal object for which it is used is to collect money due from the drawee to the drawer. For instance, if Jones, of Chicago, owes Smith, of Philadelphia, $750, Smith may draw on Jones for that amount. He will deposit the draft properly drawn with his own bank in Philadelphia, which will forward it to

Exchange for £800.

New York, Sept. 3, 1900.

Ten days after sight of this First of Exchange (second and third unpaid), pay to the order of E. N. Towne, Eight Hundred Pounds sterling, value received, and charge to account of

James H. Moody & Co.

To Drexel, Morgan & Co.,
London, England.

the bank with which Jones does business in Chicago, and which is called its correspondent. The draft when received in Chicago is presented to Jones at his place of business, who pays it by check or cash, or stamps or writes across its face:

ACCEPTED
JUNE 12, 1900.
PAYABLE AT
FIRST NATIONAL BANK.
JOHN JONES.

Or, he may write across the face simply "*Accepted*" and his name. The draft will then be paid at Jones' office when it falls due.

The draft in the former case becomes a check on Jones' account at the First National Bank when it is charged against his account. The bank in Chicago then credits and advises the bank in Philadelphia, which in turn credits Smith.

By courtesy Smith, when making the draft upon Jones, advises him at once of the fact, that he may be prepared to pay it.

If not paid, the draft is protested—that is, a formal statement of the fact of presentation is made by a notary and served upon drawer and all who have indorsed their names to the draft.

But if the drawer does not wish to incur the expense of protest fees, or to injure the credit of the debtor, there may be pinned to the draft a piece of paper with the words "No protest" upon it. This is to notify the bank presenting the draft that the drawer does not wish it protested if not paid. It is important that this slip of paper be detached before the draft is presented, or else the draft would lose its "force."

DRAFTS DIFFER FROM CHECKS.—When a draft is drawn a certain number of days after sight, or after date, it has three days of grace.

A check is practically a sight draft upon a bank; but there is a marked difference between a "check" and a "draft." For example: The form and wording are different; a check is drawn upon a bank or banker with whom funds have been deposited; a draft is drawn upon an individual or business house.

Checks are used for paying money to creditors; drafts are used as a means of collecting moneys due to the one drawing.

Checks, when properly drawn and presented, must be paid by the bank if it has funds belonging to the drawer.

The party drawn upon is under no obligation to honor a draft, if for any reason he chooses not to do so.

Due Bills.

A *Due Bill* is a formal written acknowledgment that a certain amount is due.

DUE BILL FOR MONEY.

200\frac{00}{100}$. Ho Hokus, N. J., July 15, 1900.

Due Charles Stillman, on demand, Two Hundred Dollars, value received.

Henry George.

It should in capitalization, punctuation, and arrangement of parts, follow the same rules as are followed for business letters.

Due bills are often given in settling accounts, when it is not convenient to make immediate payment.

Unlike promissory notes, due bills cannot properly be made payable *to order*. They are therefore non-negotiable.

The amount represented by a due bill should be expressed twice, as in a receipt, check, or note—once in writing, and once in figures.

DUE BILL FOR MERCHANDISE.

55\frac{67}{100}$. Chicago, Ill., May 12, 1901.

Due Charles F. Thomas, for work done, Fifty-five $\frac{67}{100}$ Dollars, payable on demand, in merchandise, at my store.

William C. Edwards.

Promissory Notes.

A promissory note is a written promise to pay a specified sum of money at a designated time, both of which are stated in the body of the note.

The *holder* is the person who is in lawful possession of a note, whether he is the original payee or has received the note by indorsement.

Promissory notes are divided, in common usage, into three principal kinds: Individual Notes, Joint Notes, Joint-and-several Notes. Any of these notes may be either *negotiable* or *non-negotiable*.

An *Individual Note* is one signed by a single person.

240\frac{00}{100}$. Chicago, Ill., May 11, 1901.

On demand, we promise to pay to the order of Samuel Barclay, at his office, Two Hundred Forty $\frac{00}{100}$ Dollars, value received.

Henry Ambrose,
Walter Williams.

A *Joint Note* is one signed by two or more persons who are *together* responsible for its payment, share and share alike.

A *Joint-and-several Note* is one signed by two or more persons, all of whom together, or *any one* of whom *separately*, may be held

for the whole amount. The words, *We jointly and severally promise*, which are found in this note, are equivalent to *We together and separately promise*. Accordingly, when such a note matures, if all the signers are able to pay, they contribute share and share alike; while if one or more cannot pay, the whole amount is paid by the remaining one or more.

$851\frac{60}{100}$. *Salem, N. J., Jan. 13, 1901.*

Three months after date, for value received, we jointly and severally promise to pay William Johns or order, at the Second National Bank, Eight Hnndred Fifty-one $\frac{60}{100}$ *Dollars, with interest.*

Henry Swartz.
Levi Douglass.

A note is made negotiable, that is saleable, by making it payable to a person, or his order, or to his assigns, or to bearer, or to the cashier of a bank or incorporated company. A note so drawn may be negotiated, or used in payment to another person by the holder; but he must indorse his name on the back of the note. Should the drawer of the note fail to pay it, the holder looks to the person or persons who indorsed it for payment.

A note payable on a certain day is usually due three days later. These three days are called *days of grace*. Thus a note for one month, dated March 1st, need not be paid until April 4th, the last day of grace. Notes payable on demand are not entitled to any grace. Should the last day of grace fall upon Sunday or upon a legal holiday, it must be paid on the day previous. Thus a note due December 25th, must be paid on the 24th of that month.

A note made payable at a bank and held there for payment until the usual hour for closing, need not be presented to the drawer in person to bind the indorser. It may be protested as in the case of drafts, immediately upon the close of bank-hours. Payment must be immediately demanded of the indorser if he resides in the same place; if he is a non-resident he must be notified at once by letter.

Discounting Note at Bank.

When notes are offered at bank they are passed upon by its officers or directors, or both, to satisfy themselves that the maker and indorsers are good for payment. If accepted the bank charges interest or discount at an agreed upon rate reckoned upon the face of the note for the time for which the note is to run from the day it is discounted. For instance a note for $500 drawn and dated April 1, 1901, payable in 3 months, would be due and payable July 1st or 4th. If offered at

No. 114 *Amt.* $1300

To Alfred Sidney

For On ac.

Payable Merchants' N. Bank

Time 3 mos.

Due June 13, 1901

$1300\frac{00}{100}$. *Nyack, N. Y., Mch. 13, 1901.*

Three months after date, for value received, I promise to pay to the order of Alfred Sidney at the Merchants' National Bank, Thirteen Hundred $\frac{00}{100}$ *Dollars.*

Wm. B. White.

No. 114.

A Promissory Note and stub, showing record of note. This record may also be kept in separate book for notes payable and receivable.

bank for discount on May 1, 1901, the bank would reckon the interest from May 1st to July 4th. It is to be noted that the bank takes its interest in advance and pays to holder of note the proceeds which is the face value less the bank interest or discount. To compute the value of a note which reads "*with interest*," you add to the face value the interest which will be due at the maturity of note. Upon this value the bank reckons its discount.

Indorsements, a Summary.

Indorsements are entries written on the back of any paper, whether checks, notes or drafts. They show either a transfer of title, a giving of security, or a receipt for a payment applying on the contract indorsed.

We give here, plainly marked, the various forms of indorsements:

No. 1 is the more common and safest form. It transfers the ownership from Smith to Jones, and makes Smith responsible to Jones in case the maker or payer of the paper fails to pay it.

No. 2 transfers ownership, but relieves Smith from any responsibility if the paper is not paid when due. Only under special circumstances is this used.

No. 3 transfers the ownership to any party who may hold the paper, making it in effect payable to the bearer. Such paper should not fall in hands of strangers.

No. 4 transfers the ownership as in No. 3, except that it relieves Smith from further responsibility.

1 (*Transfer of Title.*)	2 (*Without Recourse.*)	3 (*In Blank.*)	4 (*Blank—Without Recourse.*)	5 (*For Money paid.*)	6 (*For Collection.*)	7 (*Protest Waived.*)
Pay to the order of Henry Jones. JOHN SMITH.	Pay to Henry Jones, or order, without recourse. JOHN SMITH.	JOHN SMITH.	Without recourse. JOHN SMITH.	Oct. 4, 1900., Received on within note Fifty ($50) Dollars.	Pay to the order of the Commercial National Bank of Lansing Mich., for collection. JOHN SMITH.	Notice and protest waived. JOHN SMITH.

When a paper is written payable to the order of John Smith, and he wishes to transfer his title to Henry Jones, he writes on the back of the paper an order for its payment to Jones.

For the convenience of bank-tellers and others who have large numbers of such indorsed papers to handle daily, it is well to write the indorsement across the left end of the paper.

On negotiable papers that are likely to have several indorsements, care should be taken to write the indorsements as close together as is convenient. If the back of the paper should be covered with indorsements, other indorsements can be written on blank paper attached to the original.

No. 5 is a receipt for money paid to apply on the promise indorsed. Such indorsements need no signature as it might have the effect of a receipt in full.

No. 6 does not transfer the ownership of the paper, but merely gives authority to collect the paper as Smith's agent and to place the amount collected to his account.

No. 7 relieves bank of responsibily of serving notice and protest.

Receipts.

A *Receipt* is a written acknowledgment, signed by the receiver and delivered to the giver, showing that certain property (money or goods, or both) has been received.

MONEY CENTRES OF THE WORLD

London is the great money centre of the world. Then New York, Berlin, Paris and Vienna form centres in which great business enterprises originate.—Banks, Clearing Houses and Bourses are the great financial bodies for the handling of money and commercial paper and for facilitating national and international exchanges.

RENTAL RECEIPT.

Lease No. 2 November 1, 1900.

Received of Anna P. Johnston $475.00/100 Four Hundred Seventy-five 00/100 Dollars, being in full for the yearly rental on my farm of 150 acres, in Fifth District, Clinton Co. Ia. From Mar. 1, 1900 To Mar. 1 1901.

In accordance with the terms of a lease to Alfred Johnston dated Nov. 1, 1899 ~~190~~

George F. Hoar.

Every word which expresses number, unless connected with preceding word by a hyphen, may or may not begin with a capital. But there should be uniformity in this particular in papers drawn by same parties. The amount of money received is written in figures in the left-hand corner.

There are three kinds of receipts: (1) *Receiptsin Full*; (2) *Receipts on Account*, and (3) *Receipts to Apply on Particular Accounts*.

The first is given when the payment is a complete settlement; the second, when partial payment of a debt is made; the third, when there are more accounts than one between the persons, and the payment is intended to apply to a particular one.

(1)

$457 00/100. *Akron, O., Jan. 12, 1901.*

Received from George B. Waterson, Four Hundred Fifty-seven Dollars, in Full of all Demands.

Albert S. Lucien.

(2)

$341 00/100. *Wilmington, Dela., Nov. 16, 1901.*

Received from Lyman D. Willard, Three Hundred Forty-one Dollars, on account.

Charles F. Gibson.

Per Anna Brown.

(3)

$375 75/100. *Portland, Ore., Aug. 17, 1901.*

Received from B. Braddock, Three Hundred Seventy-five 75/100 Dollars, to apply on rent of house.

Frank Berry.

[BILL OF SALE]

IN CONSIDERATION OF

Two Hundred Seventy-four . . . DOLLARS, receipt of which is hereby acknowledged, *I, S. D. Haag*, of County of Erie and State of Pennsylvania, do hereby sell and convey unto Peter Cline, of County of Erie, and State of Pennsylvania, the following described personal property.

Dark Bay Horse, "Nepos," 17½ Hands High, 1600 lbs. weight, with star on forehead and white on right hind foot.

And I do hereby covenant and agree to warrant and defend the above described personal property against the lawful claims af all persons.

Signed this 5th day of May, A.D. 1902.

S. D. HAAG.

Lease—Form A.

This Agreement, Made between *R. B. Congdon* of the County of *New Castle* and State of *Delaware* of the first part, and *C. S. Milligan* of *Wilmington, Delaware* of the second part, witnesseth: That the said party of the first part has this day leased unto the party of the second part the following described premises, to-wit:

The First Floor and Basement of the Storeroom No. 199 Market Street

for the term of *One Year* from and after the *first* day of *March* A.D., 1901, at the *Monthly* rent of *Thirty-seven 50-100 Dollars* to be paid as follows, to-wit:

On the date of this Lease and on each month thereafter in advance

And it is further agreed that if any rent shall be due and unpaid, demand therefor being waived, or if default be made in any of the covenants herein contained, it shall then be lawful for said party of the first part to re-enter the said premises and remove all persons and property therefrom, or he may recover possession thereof, by action for the forcible detention of said property as provided for in the laws of the state pertaining to rented property.

And the said party of the second part agrees to hire said premises, and to pay the party of the first part therefor the *Monthly* rent of *Thirty-seven 50-100 Dollars* to be paid as follows, to wit: *On the date of this lease and on each month thereafter in advance* except when said premises are untenable by reason of fire from any other cause than the carelessness of the party of the second part, or of persons of *his* family, or in *his* employ, or by superior force or inevitable necessity

And the said party of the second part covenants that *he* will use said premises as a *storeroom* and for no other purpose whatever; and that *he* especially will not use said premises nor permit the same to be used for any unlawful business or purposes whatever; that *he* will not assign this lease or let or underlet said premises without the written consent of the lessor, under the penalty of the forfeiture of all *his* rights under the lease; and that *he* will use due care and diligence in guarding said property from damage; that *he* will keep the same in such repair as the same now are, or may at any time be placed in by the lessor, damages by superior force inevitable necessity, or fire from any other cause than from the carelessness of the lessee, or persons of *his* family, or in *his* employ, excepted; and that at the expiration of this lease, or upon a breach by said lessee of any of the covenants herein contained *he* will, without further notice of any kind, quit and surrender the possession of said premises in as good condition as reasonable use, natural wear and decay thereof will permit, damages by fire as aforesaid, superior force, or inevitable necessity, only excepted.

IN WITNESS WHEREOF, the said parties have hereto subscribed their names on this *first* day of *March* A.D., 1901.

WITNESSES:

Charles Worth

Henry Ryan

R. B. Congdon

C. S. Milligan

Lease.—It is important both for the owner of the property and the one who rents it that the agreement be properly and carefully drawn, signed and witnessed. Each party to the agreement should keep a copy duly signed and witnessed.

(ITEMIZED BILL RECEIPTED)

Los Angeles, Cal., *October 31,* 190–.

Mr. *EBEN HOLDEN*

To R. E. CARTWRIGHT & CO., Dr.

Accounts Rendered Monthly.

October	*2*	*14 yards Silk*	*at $1.60*	*$22*	*40*		
		7 " Lining	*" .18*	*1*	*26*		
		½ " Braid	*" .20*		*10*		
		26 " Muslin	*" .12½*	*3*	*25*		
		2 doz. Buttons	*" .37½*		*75*		
		15 yards Flannel	*" .33⅓*	*5*	*00*		
						$32	*76*

Received payment,

Nov. 15, 190-. *R. E. CARTWRIGHT & CO.*
Per. Bowers.

Making Out an Account and Receipting Bill.

When merchandise is sold or services are rendered a detailed statement should be made out. This is called a bill, or an account. The *debtor* is the one who owes the money, and the *creditor* the one who receives it. Goods are said to be sold on account or credit when they are not paid for on delivery.

Business Correspondence.

Great importance attaches to business correspondence, for a large part of the world's business is done through the mails or by telegraph. To facilitate the handling of so much mail it is important that business letters should have a uniform style and one which will secure clearness and accuracy in statement. Before giving a few model forms we would call attention to the following points, which we may term

Essentials for a Business Letter.

Use good paper and envelopes and black ink.

Study to arrange your letter to give it the best possible appearance, leaving a margin of a half inch or more at the left of the page, and dividing the letter into paragraphs whenever a new subject is to be considered.

Re-write the letter rather than to have erasures or blots.

Do not write the letter with a pencil, and do not use foolscap paper.

Fold the letter neatly to fit the size of the envelope.

Use as few words as possible and state clearly what you have to say.

Give the address plainly, including street or post-office box, town, and state, or province. Address the envelope carefully and examine before sending.

Read the letter when written to assure yourself that there are no omissions or mistakes.

Keep copies of all important business letters and file letters received.

When writing to others for information enclose a stamp or prepaid envelope.

In writing letters requesting payment, employ only the most gentlemanly terms and polite language.

When addressing strangers use "Sir" or "Dear Sir." A married lady is addressed as "Madam" or "Dear Madam," an unmarried lady as "Miss" or "Dear Miss;" it is allowable also to say "Dear Madam." In writing to a firm, company, or a number of persons the address is "Gentlemen" or "Dear Sirs." Never use the abbreviation "Gents."

In replying to a letter first acknowledge its receipt and mention the date. Use sparingly contractions and abbreviations.

The closing words of letters should be "Yours truly," "Yours respectfully," "Respectfully yours," or "Respectfully."

How to Begin a Letter.

We give below a few forms for beginning letters, where the paper is not provided with a printed heading. The first line on ruled paper is generally about an inch and a half below the top of the page. This is the proper place to begin. On the first line, beginning near the center of the paper, is written the name of the town and state, or the number of the street, with the name of the town and state on the second line. On the line below follows the month, day and year; on the succeeding line, at the left, the name of the party to whom the letter is addressed; the next line or two lines are occupied with his post-office address, and on the following line the address proper, "Dear Sir," etc.

Kokomo, Ind.
October 25, 1903.

Mr. J. T. Terhune,
Lancaster, Pa.

Dear Sir:

We are pleased to acknowledge the receipt of your letter of the 10th inst., etc.

Kennet Square, Penna.
April 2, 1904.

Messrs. Kent & Tatnall,
211 Market Street,
Philadelphia, Pa.

Gentlemen:

Please ship me the following order of goods, etc.

Closing a Letter.

Never fail to sign a letter, using your full name, and write it clearly, that there may be no error in sending your reply. If a lady is writing to a stranger she should sign her name with her proper title "Miss" or "Mrs." preceding in parentheses. There are various forms of closing letters, of which the following are the more common:

Yours truly,
(Miss) Mary Jones.

I remain,
Yours respectfully,
E. G. Ziegler.

I am,
Yours truly.
Robert M. Worth.

To Charles M. Jones,
Ogontz, Pa.

How to Address an Envelope.

Commence the name a little to the left of the centre of the envelope, and about one-half way down from the top. Write the name of the party addressed, with the number of the street on a line below, a little to the right, the city or town on a line next below and to the right, and last the state or province. The county may be placed in the lower left hand corner. The following is an example:

J. H. HOUSTON,
98 Adams Street,
Toronto,
Canada.

We give here a few letters as models of the most common forms which occur in business. These will be sufficient to suggest what forms may be adopted for others.

Letter of Application.

749 Monroe St.,
Milwaukee, Wis.,
December 20, 1901.

Messrs. Gerhart & Co.,
121 La Salle Ave., Chicago.

Gentlemen:

I notice in this morning's "Eagle" your advertisement for a salesman, in reply to which I am pleased to offer my services.

I am twenty-nine years of age, and have had four years' experience in one of the leading houses of Milwaukee, in the employ of Messrs. Galt, Smith & Co., to whom I

respectfully refer you. I also enclose to you copies of letters of recommendation, which I trust will be satisfactory to you.

I shall be pleased to arrange for an interview with you, if that be your pleasure. Awaiting your early commands, I am,

Very truly yours,
Emery Earles.

A Letter Ordering Goods.

179 Jerome Avenue,
Guelph, Ontario,
January 5, 1902.

Messrs. C. B. Smith & Co.,
Toronto, Canada.

Gentlemen:

Please send me by express, as soon as convenient, the following books:

1. *Tennyson's Poems (Complete.)*
2. *Thomas' Algebra.*
3. *Hopkin's History of Canada.*

Please advise me of shipment and send an itemized bill, allowing the usual discount.

Very respectfully yours,
John A. Hewes.

Letter Asking for Settlement of Account.

Toronto, Ontario,
April 1, 1902.

Mr. John A. Hewes,
Guelph, Ont.

Dear Sir:

We enclose a statement of your accout somewhat overdue, and shall feel greatly obliged for the settlement of the same at an early date, as we have several heavy payments to make.

Trusting that you will excuse us for troubling you, we are,

Very truly,
C. R. Smith & Co.

Enclosing Statement of Account.

Cincinnati, Ohio,
April 1, 1903.

Messrs. Allibone & Simmons,
Terrehaute, Ind.

Gentlemen:

We enclose you herewith statement of your account for the last three months, which we believe you will find correct. We shall be glad to have you examine the same at your earliest convenience, and shall be happy to receive your check for the amount, or instructions to draw on you in the ordinary course.

We are, gentlemen,
Yours very truly,
R. C. Bancroft & Co.

Enclosing Remittance.

Boscobel, Wis.,
June 21, 1903.

John Wanamaker,
Philadelphia.

Dear Sir:

The goods ordered of you on the 5th inst. have been received and are entirely satisfactory in both quality and price. I enclose you herewith my check for $175.91, the amount of your bill, which kindly receipt and return.

Very truly yours,
Thomas Upton.

Opening an Account.

Jefferson City, Mo.,
September 15, 1902.

Messrs. R. B. Smith & Co.,
St. Louis, Mo.

Gentlemen:

I desire to open an account with you as I expect to have need to order frequently goods of the lines you carry, and it will be more convenient for me to settle the first of each month than to make remittance with each order. I am permitted to refer you to Dr. C. F. Peterson, 99 Monroe Street, of your city, who knows me well, and also Brown & Johnson, bankers of this city, who are well acquainted with my financial standing. Should my references prove satisfactory, will you kindly forward me at once by express, the following goods:

3 dozen Napkins at about $3.00.
2 boxes Ladies' Fine Hose.
3 dozen Ladies' Hemstitched Handkerchiefs at about $2.75.
15 yards of Gingham, light color about 18 cents.

Hoping my proposition to open an account will be satisfactory, and that the enclosed order may meet with your prompt attention, I am

Yours respectfully,
Peter Andrews.

Acknowledging Receipt of Order.

OFFICE OF
R. B. SMITH & CO.
200-25 DAUPHIN ST.

St. Louis, Sept. 21, 1902.

Peter Andrews,
Jefferson City, Mo.
Dear Sir:

Your favor of the 15th is received. The references are quite satisfactory and we shall be pleased to have your account.

The goods ordered are now being packed, and we will ship them per Illinois Central to-morrow.

Thanking you for the order, and hoping your goods will reach you promptly and in good condition, we remain,

Very truly yours,
R. B. Smith & Co.
per S.

Practical Points for the Correspondent.

Abbreviations.—Use only authorized abbreviations, and attempt no short cuts of your own. Consult a dictionary when in doubt. Do not say "Phil." for "Philadelphia," or "G'n't'n" for "Germantown." Use "and," not the sign "&." Abbreviations denoting professional standing, as "M. D.," "D. D.," "LL. D.," and "M. A." are used chiefly on title pages. When used on letters the names are not preceded by titles such as "Mr.," "Professor," etc.

Address.—The name and address should be written plainly so that "N. Y." will not be mistaken for "N. J.," "Mo." will not be mistaken for "Me.," "Md." for "Ind.," nor "S. C." for "S. D."

Avoid fancy note paper. Avoid postals for private correspondence. Avoid flourishes. Avoid crooked lines. Avoid unusual colors in inks. Avoid grumbling on paper. Avoid slang. Avoid the capital "D" in "My dear Sir." Avoid erasures and blots. Avoid writing with pencil. Avoid frequent repetition of the same word. Avoid too many "and's" and "very's" and "so's" and "well's." Avoid the use of figures instead of words denoting numbers. Avoid awkward folding of the letter. Avoid matters of private confidence and friendship in business letters. Avoid delays in answering invitations. Avoid displaying temper in letters.

Dating Letters.—It is important to date the letters at the beginning, that it may not be overlooked, giving the day of the month and the year. The correct contractions for second, third, etc., are 2d, 3d, etc. In referring to other dates, "inst." refers to the present month, "ult." to the preceding month and "prox." to the following month, as "23d prox." means the 23d of next month. Care should be taken in using these abbreviations.

Initials.—Full names, not initials, should be used. It is difficult to know whether "R. Jones" means "Reuben Jones" or "Rebecca," or whether the writer should say "Mr. Jones" or "Miss Jones." One's own name should always be written legibly. Only cashiers are allowed fancy signatures.

Materials.—The best stationary only is good enough. Paper and envelopes should correspond in color and quality. Business letter sheets are either 5x8 (note size) or 8x10 inches (letter size.)

Mistakes.—Over 5,000,000 letters go astray each year on account of mistakes in envelope addressing. Letters are sent with money enclosures and orders for goods, which the sender never hears from, for there is no address in the letter, or the signature may be omitted; therefore, don't make mistakes.

Official Letters.—It is better to say, "To the Commissioner of Patents, etc., Sir," than to say "To the Honorable A——— S———, Commissioner of Patents, etc.," and if the writer is an official, it is proper for him to place his title after or below his signature.

One Side.—Write on one side only of the paper in business correspondence, that copies may be easily taken.

Ordering Goods.—Give complete directions as to method of shipment, whether by railway or other transportation, and state explicitly the kind and amount of goods you wish shipped. Also state the amount of money you enclose in your letter, or how it will be sent.

Return Postage.—In writing about your own affairs, requiring an answer, it is proper to enclose a stamp or stamped envelope.

Spelling.—A small dictionary of common words is an important adjunct to everyone's writing desk. Good spelling only comes from practice and experience in careful reading.

Style.—The general appearance of a letter depends upon the degree of attention given it as to its legibility, correct spelling, paragraphing and punctuating, and also to the freedom from blots, interlineations and erasures. Style also depends upon the beginning and ending of the letter, that they be uniform and artistic in arrangement.

Telegrams.—Correspondence by telegraph is expensive, and such communications are called "messages." They should be brief, concise, and give exact meaning. They should not omit necessary words or be capable of more than one meaning. It is always best to write carefully what you wish to state, recast it, if possible, to say the same thing in fewer words. See that the name and address are plainly written, and your own name and address are signed. Omit all forms of salutation at beginning and close of the message. The following shows a concise message:

Philadelphia, Pa.

John W. Ferris,
Central Block
Pueblo, Colorado.

Father very ill. Come immediately. Draw on me for funds.

WILLIAM FERRIS.

PRACTICAL BOOKKEEPING

WHY ACCOUNTS ARE KEPT—PROFITS AND LOSSES—RECORDS OF BUSINESS TRANSACTIONS—SINGLE ENTRY BOOKKEEPING—A MODEL SET OF ACCOUNTS—DOUBLE ENTRY—THE BOOKS USED—A MODEL SET OF DOUBLE ENTRY ACCOUNTS—TRIAL BALANCES

THE SCIENCE OF ACCOUNTS

Bookkeeping is both a science and an art. It is based upon custom and utility, the principles of which have been formulated into general laws, which have been adopted throughout the business world. In this sense it is a science. The recording and mechanical part, including the accuracy in arrangement of business transactions, is the art. To become efficient in both the science and the art it is necessary to master the principles and laws and apply them with accuracy and rapidity.

The object of bookkeeping is to keep an exact record of the amount of money, merchandise and other properties received and disposed of, and the amount of each on hand.

Bookkeeping is practiced in two ways or methods, which are known as *single* and *double* entry. In opening up a business, the business itself is the first thing to be considered; the recording or specifying the transactions is secondary. The former will determine largely the method to be followed.

Every man, whether he be a laboring man, farmer, tradesman, or professional man, should keep a record of all dealings which require a record of the receipt and expenditure of cash. Every wage-earner should take a few minutes at the close of each day to make a record of his cash, as well as the articles he has purchased during the day and had charged. When this is done there will be great satisfaction in knowing how the money has been spent, and oftimes much assistance in checking needless expenditure. A farmer can make use of a simple form of bookkeeping in keeping a record of the cash he receives for the different products of the farm, and the cash expended for improvements, for material, and for labor. It will not be difficult for him to determine with great certainty which department of farming that he has tried yields the best returns. He should open an account with each one of his laborers, entering under the name a memorandum of the terms of the agreement, with the former address of the employee. In keeping an account with a person to whom goods are sold, when the account is paid in full it should be closed. If only a part is paid, credit should be given and the account closed, with the balance brought forward. A farmer can also, as we have said, keep an account with any department of his work, such as his wheat field, his corn field, or his cattle, charging to each the labor, seed, fertilizer, etc., and crediting to it the returns from the sale of the crop and the value of such portions as may have been used on the farm. In the same way, a mechanic should keep an account of each piece of work that he undertakes, especially if it be on contract, that he may ascertain the amount of his profit or loss. This will be a good guide to him for future estimates. These accounts are commonly called Property Accounts, and may be kept in the same form

as used for Personal Accounts, that is, accounts kept with individuals.

The Books Used in Single Entry Bookkeeping.

The different books used in bookkeeping will be learned as we follow the forms given on the succeeding pages. The three important ones are:

The Cash Book. This is used to show all receipts and payments of cash, and also all personal debits and credits for cash, which must be entered in the ledger.

The Day Book. This book is used to keep a record of transactions for which cash is not paid or received, but the amounts of the transactions are to be entered in their proper places in the ledger, as indicated in the day book. Every transaction entered in the day book indicates that the person or account so entered is either debtor (Dr.) or creditor (Cr.) in reference to the one who owns or manages the business represented by the book. This book is generally ruled with two amount columns, the first being for the items of transaction, and the second for the total of these items.

The Ledger. This is not a book of original entries, but is a record of what has been first entered in another book, such as the *Cash Book* and *Day Book, Notes Receivable* and *Payable Books, Blotter*, and such other books as may be required, depending on the nature and extent of the business; hence, items do not appear in the ledger; but in a column ruled for that purpose is placed the folio or page of the book from which the entry is posted, as entries made in day book and cash book give a history of the transaction. They are sometimes called *Historical Entries.*

It is best to observe the following directions for entering items in the cash book and day book:

1. *Be uniform in describing transactions of the same kind.*

2. *Every transaction should have an entry made on the day on which it occurs.*

3. *The quantity and price of each item should be given in entering sales on account; likewise in recording purchases on account.*

4. *Do not erase or interline any entries made in cash book or day book. If any errors are made mark them "Void" and make the entry a new one. This will show that no fraud was intended if the books are examined in court. Corrections and erasures may be made in ledger and other books, although these should be avoided.*

5. *Exercise great care in writing figures, as corrections cannot be easily made.*

Single Entry Bookkeeping.

Single entry bookkeeping is simple, and is generally adopted by shop people and small concerns who deal in a great variety of articles and where the sales are small and numerous. This method affords some knowledge of the condition of the business to the proprietor; by this system it often seems a tedious method to enter each sum singly in the ledger. The ledger contains the names of all parties with whom transactions take place. The debtor and the creditor accounts of each party are arranged on the opposite pages, the debtor being on the left-hand side and the creditor on the right. Thus, if merchandise is sold to A, A is made debtor (Dr.) to merchandise and merchandise is made creditor (Cr.) to A. The key to bookkeeping is found in the following: *Debit what is received or what costs value; credit what is parted with or what produces value.* The person from whom you buy goods or receive money is the *Creditor*, and those to whom you sell goods on credit or pay money is the *Debtor.* When a thing is received its account is debited; when cash is received, cash is debited; merchandise, merchandise is debited; hence, when a person receives something of value from us without giving value in return we debit that person. When cash is paid out, cash is credited; merchandise is sold, merchandise is credited.

The cash book not only is very useful, but quite essential whether kept by single or double entry. When you receive money you enter it on the debtor's side or left-hand page; when you pay out money you enter the sum on the credit or right-hand page; the difference between two sides of a cash book will always show

a debit balance which is equal to amount of cash on hand. The credit side of the account can never be larger (unless your account is overdrawn) than the debit side, since it is impossible to pay out more cash than has been received. To close the cash account write on the credit side, in red ink, the total amount on hand and the word *balance*, and bring the balance down on the opposite side in black ink, as above:

Cash Book.

190	Dr.			Cr.	
April 2.	To H. F. B.,	4000.00	April 5.	By Interest,	50.00
" 5.	" Note,	500.00	" 15.	" S. Conrad,	60.00
" 26.	" Sundries,	500.00	" 24.	" Expense,	90.00
		5000.00	" 30.	" Balance, (*in red*)	4800.00
					5000.00
April 30.	To balance,	4800.00			

Suppose, however, you are a merchant and your customers keep running accounts. You will then find it necessary to have a day book, cash book, and ledger. For example, a customer, Mr. J. G. Howard,

Diagram I.

	Dr.			Cr.	
Jan. 2.	To Cash,	100.00	Feb. 4.	By Expense,	30.00
				" Balance,	70.00
		100.00			100.00

As can be seen, the balance is obtained by adding the amount paid out, $200.00, and deducting from the total amount received, $5,000.00, the remainder being the amount on hand, $4,800.00.

comes in and asks for a statement of his account. Looking up the name in the index to the ledger, we find Mr. Howard on folio 78. Turning to his account we discover the following, as in Diagram III.

Diagram II.

CASH.

	Dr.			Cr.	
Jan. 1.	To Invest Account,	1000.00	Feb. 20.	By Repairs,	150.00
" 1.	" Cash,	2000.00		" Paper,	100.00
" 1.	" Sales,	500.00		" Labor,	500.00
" 1.	" Note,	500.00		" Expense,	50.00
				" Presses,	2,000.00
				" Equipment,	1,200.00
		4000.00			4000.00

A person doing a strictly cash business needs only one book, the cash book, and on its proper side all transactions are written. For instance, in Diagram I, his cash book shows, on the debtor side, a transaction of $100.00, The debtor side, or what he owes you, is $288.50; the credit side, or what you owe him, or what has been paid, is $260.00, the difference being $28.50, this being in your favor and, therefore, is debit to you; if he

pays the $28.50, enter it on creditor side of ledger, *By Cash 28.50*, debit your cash book, and then rule off the account with two parallel short lines in red as both sides of the account will then be the same.

Diagram III.

J. G. HOWARD.

1901	Dr.		1901	Cr.	
Jan. 1.	To Mdse.,	$200.00	Jan. 1.	By Cash,	$60.00
" 15.	" "	30.00	" 14.	" Note,	100.00
" 25.	" "	58.50	" 17.	" Cash,	50.00
			" 19.	" Note,	50.00
				" Balance,	28.50
		$288.50			$288.50
	To Balance,	$28.50			

A TRIAL LIST OF TRANSACTIONS

The following items will be found written up in the Day Book, Cash Book, Ledger, Bills Receivable and Bills Payable Books of succeeding pages. They should be carefully traced through the respective books and the reasons for their being so entered will be evident. Then the learner will do well to procure paper properly ruled and write up the transactions for himself. First reproduce by copying and afterward try to write up the whole set from the list given here; then compare and correct errors. In this way he will be able to master the subject.

190 .			
Jan. 1.	Began business with		$4,000
	Bought goods as follows of		
	E. J. White,		300.40
	Henry Short,		482.00
	Mrs. Pearl Cook,		600.00
	Ralph Wilson,		248.60
	Sold merchandise for cash,		29.60
Jan. 2.	Paid E. J. White,		160.00
	Paid Henry Short,		240.00
	Paid Mrs. Pearce Cook,		300.00
	Paid Ralph Wilson,		122.00
	Gave notes to		
	E. J. White, 2 mos.,		80.00
	Harry Short, 2 mos.,		180.00
	Mrs. Pearl Cook, 3 mos.,		120.00
	Ralph Wilson, 1 mo.,		80.00
	Bought merchandise of		
	M. Young,		397.28
Jan. 3.	Sold to Jones & Co. merchandise as follows:		
	Paper,	48.00	
	Books,	52.80	
	Pads,	44.00	144.80
	Received Jones & Co. merchandise,		72.40
	3 mos. note,		72.40
	Sold A. Daniel, merchandise,		101.60
	Received from A. Daniel, cash,		40.00
	3 mos. note,		61.60
Jan. 5.	Sold to Bowers & Co., merchandise,		148.64
	Received from Bowers & Co., 2 mos. note,		148.64
	Paid M. Young, note paid to me by A. Daniel,	61.60	
	Also the 2 mos. note of Bowers & Co.,	148.64	210.24
	Bought of W. Henderson, merchandise,		240.00
	Sold him merchandise,		164.60
	Sold for cash, merchandise,		13.20
Jan. 6.	Paid wages,		8.44
	Paid expenses,		13.20
Feb. 5.	Paid note, Ralph Wilson,		80.00
Mar. 5.	Paid note, E. J. White,		80.00
	Paid note, Harry Short,		180.00
Apr. 5.	Paid note, Mrs. Pearl Cook,		120.00
	Received note of Jones & Co.,		72.40
Apr. 7.	A. Daniel's note returned by M. Young not honored,		61.60
Apr. 8.	Paid rent,		160.00
	Paid personal tax,		40.48
	Paid real estate tax,		30.40
May 1.	Sold merchandise to		
	Mackay & Co.,		40.00
	M. H. Smith,		36.48
	A. M. Jenks,		160.00
	E. Soley,		240.00
	F. M. Johnson,		148.40
Jun. 1.	Received the following notes at 3 mos.:		
	Mackay & Co.,		40.00
	M. H. Smith,		36.48
	A. M. Jenks,		160.00

January 1, 190–

	Began business this day, investing $4000.00 in cash.				
	"				
10	E. J. White. Cr.			300	40
	Bought of him as per invoice				
	"				
12	Harry Short. Cr			482	00
	Bought of him as per invoice				
	"				
13	Mrs. Pearl Cook. Cr.			600	00
	Bought of her as per invoice.				
	"				
14	Ralph Wilson. Cr			248	60
	Bought of him as per invoice.				
	"				
15	M. Young. Cr			397	28
	Bought of him as per invoice				
	3				
16	Jones & Co. Dr.			144	80
	Sold them the following goods, ½ cash, balance on note at 3 mos.				
	Books.	52	80		
	Paper 48.00 and Pads 44.00	92	00		

PRACTICAL BOOKKEEPING
This page and others of the series have been prepared for this work by an expert accountant and by Professor R. S. Collins, the Eminent Business College Instructor and Penman. The simplest and most approved forms used in Bookkeeping are shown. Full instructions are given in the text

Dr. Cash.

190-								
Jan. 1	1	(Your name)	Investment.	4000	00			
" 2	1	Mdse.	Cash sales	29	60			
" 3	17	A. Daniel.	On acct.	40	00			
" 4	1	Mdse.	Cash sales.	13	20	4082	80	
						4082	80	
Feb. 1		Balance on hand.				3239	16	
						3239	16	
Feb. 5		Balance on hand.				3159	16	

Single Entry.—Explanations.

The Journal.—On page 75 all the items of the trial list that belong to the Journal will be found in their proper places. Page 71 is prepared to show you how these will appear when neatly written in the Journal. As the $4,000.00 item does not appear in the Ledger account, but does appear in the cash, it is not carried out to the dollars' and cents' column. You will note that in the Journal in the open unruled space at the top is the date of opening the business. Each succeeding date of that month, as 3, 5, 7, and so on, is written down the centre of the page at the opening of that day's transactions. Each transaction has below it a line in black, broken in the centre with two dots. At the left in a column is the folio in the Ledger to which that item is carried. Cr. and Dr. indicate on which side of the account in the Ledger the item is posted. The account is *credited with what is received from it, and debited with what is sold to it*, as will be seen. Where two or more items are specified, the amount of each item appears in the first column for dollars and cents, and the total amount is carried to the second column.

The Cash Book.—On pages 72 and 73 is shown how the two sides of the Cash Book should be written, the debit side being on the left and the credit side on the right, facing each other. On pages 76, 77, the single entry cash for this is shown complete. Enough should be told in entering each account to explain the transaction. It will be noticed that there are rulings at the left for the date and Ledger folio, and the right two columns for dollars and cents, the second of which is used in balancing the account at the end of the month, or at any given period. The line down the centre of the page of the Cash Book is usually a pale blue line for convenience of the bookkeeper in arranging his explanation to the right of it. It is not a necessary line. At the end of each month it is well to balance the Cash Book, and begin the next month by bringing down the balance on hand. The debit side of the cash account represents the money received, the credit side the money paid out. The debit side should always exceed the credit side in the cash account. *Balance on Hand*, marked with a star, is usually writtten in red ink, as also is the double line drawn beneath. You should also note where the single and double horizontal lines begin and end.

Cash. Dr.

190-									
Jan	2	10	E. J. White	On acct.		160	00		
"	2	12	Harry Short	"		240	00		
"	2	13	Mrs. Pearl Cook	"		300	00		
"	2	14	Ralph Wilson	"		122	00		
"	2	V	Expense			21	64	843	64
* "	31			Balance on hand				3239	16
								4082	80
Feb.	5	V	Bills Payable	No. 4.		80	00	800	
* "	5			Balance on hand				3159	16
								3239	16

The Ledger.—As the story of each transaction is told in the Cash Book, Day Book, or Bills Receivable Book, the Ledger does not furnish a history of each transaction; therefore less space will be required, and both sides of the account, the debit and credit, may be kept on one page, while in the Cash Book two pages are required for the accounts. The rulings for the Ledger, as you will observe, are entirely different from those of the preceding books. Spaces are provided for the date, for the folio of the Cash Book or Day Book, and for dollars and cents. Every item found in the Ledger should have a reference back to another book, where explanation can be found of the transaction.

How Accounts are arranged in the Ledger. While you may give one full page of the Ledger to each account, it will often be found more convenient to arrange two, or even three accounts on a page. The first, of course, will be at the top, and the second one, half way down. The name of the account is always written in large script in the centre of the page, from left to right, with Dr. and Cr. at the left and right respectively. The year may be written either immediately below or above the top line. If any one account is an important one, which is likely to be used freely, and which may contain many items, it will be best to allow it a full page. When all the space on any given page is filled, the account is transferred to another page by closing it with the words, "To" or "By Balance carried to Folio (—)" and beginning the transferred account on the new page with the words, "By," or "To Balance from Folio (—)." On page 74 are shown three accounts written up as they would appear in the Ledger, on three different folios, namely, 10, 12 and 13. Taking the first account, E. J. White, the first item of $160.00 is brought from the Cash Book and indicated by "1" in the folio column. The second item on the debit side, $80.00, is from the Bills Payable Book, and on the credit side item $300.40 brought from the Day Book, as indicated by the folio "1." As the credit side exceeds the debit side by $60.40, we write on the debit side in red ink, "June 30, Balance $60.40," beneath which we draw one horizontal line on each side, in red, bring down the total $300.40 beneath, draw double red line, and the account is closed for the half year. The balance of $60.40 is brought down under the credit side, indicating that we are in debt to E. J. White to that amount. It may be observed that in writing up this set of accounts the beginner should follow particularly the style indicated by the *script* pages of Journal, Cash and Ledger.

Folio 10.

Dr. E. J. White. Cr.

190-						190-					
Jan.	2	Cash	1	160 00		Jan.	1	Day Book	1	300 40	
"	2	Bills Pay.	1	80 00							
*June	30	Balance		60 40							
				300 40						300 40	
						June	30	Balance		60 40	

Folio 12.

Dr. Harry Short. Cr.

190-						190-					
Jan.	2	Cash	2	240 00		Jan.	1	Day Book	1	482 00	
"	2	Bills Pay.	2	180 00							
*June	30	Balance		62 00							
				482 00						482 00	
						June	30	Balance		62 00	

Folio 13.

Dr. Mrs. Pearl Cook. Cr.

190-						190-					
Jan.	2	Cash	3	300 00		Jan.	1	Day Book	1	600 00	
"	2	Bills Pay.	3	120 00							
*June	30	Balance		180 00							
				600 00						600 00	
						June	30	Balance		180 00	

LEDGER—SINGLE ENTRY. This page should be studied and copied as it is a model for penmanship, arrangement and ruling. * Line is written in *red*.

January 1, 190–.

	Began business this day, investing $4,000 in cash					
10	*E. J. White, Bought of him as per invoice*	*Cr.*			300	40
12	*Harry Short, Bought of him as per invoice*	*Cr.*			482	00
13	*Mrs. Pearl Cook, Bought of her as per invoice*	*Cr.*			600	00
14	*Ralph Wilson, Bought of him as per invoice*	*Cr.*			248	60
15	*M. Young, Bought of him as per invoice*	*Cr.*			397	28
	3					
16	*Jones & Co.,*	*Dr.*			144	80
	Sold them the following goods, ½ cash balance on note at 3 months					
	Books		52	80		
	Paper $48.00 and Pads $44.00		92	00		
17	*A. Daniel, Sold him Mdse.*	*Dr.*			101	60
18	*Bowers & Co., Sold them Mdse.*	*Dr.*			148	64
15	*M. Young, Paid him notes*	*Dr.*				
	A. Daniel		61	60		
	Bowers & Co.		148	64	210	24
19	*W. Henderson, Bought of him Mdse.*	*Cr.*			240	00
19	*W. Henderson. Sold him Mdse.*	*Dr.*			164	60
20	*Mackey & Co., Sold them Mdse.*	*Dr.*			40	00
21	*M. H. Smith, Sold him Mdse.*	*Dr.*			36	48
22	*A. M. Jenks, Sold him Mdse.*	*Dr.*			160	00
23	*E. Solly, Sold him Mdse.*	*Dr.*			240	00
24	*F. M. Johnson, Sold him Mdse.*	*Dr.*			148	40
	June 20					
25	*Gerhart & Co., Bought of them Mdse.*	*Cr.*			104	40
26	*Woolson, Williams Co., Bought of them Mdse.*	*Cr.*			400	00
27	*George Page, Bought of him Mdse.*	*Cr.*			348	80
28	*D. Adams, Bought of him Mdse.*	*Cr.*			341	60

DAY BOOK—SINGLE ENTRY. Sometimes called *Journal*. Dr. and Cr. indicate the left and right side of Ledger to which the different items are posted from Day Book. Ledger Folio is at the left.

Dr. —*Cash*—

DATE	FOLIO IN LEDGER			
Jan. 1	×	*Capital, cash invested in the business*	4,000	00
Jan. 2	×	*Cash for sundry sales this day*	29	60
Jan. 3	17	*A. Daniel, payment on account*	40	00
Jan. 4	×	*Cash for sundry sales*	13	20
			4,082	80
Feb. 1	×	*To Balance*	3,239	16
March 1	×	*To Balance*	3,159	16
April 1	×	*To Balance*	2,899	16
	×	*Bills Receivable, No. 1*	72	40
			2,971	56
June 30		*Balance*	2,559	08

CASH BOOK—SINGLE ENTRY. All moneys received are entered on this page and posted to the Cr. column of Ledger and folio entered in column at left.

—Cash— Cr.

DATE	FOLIO IN LEDGER			
Jan. 2	10	*E. J. White*	160	00
	12	*Harry Short*	240	00
	13	*Mrs. Pearl Cook*	300	00
	14	*Ralph Wilson*	122	00
	×	*Expenses*	21	64
			843	64
		Balance [written in red]	3,239	16
			4,082	80
Feb. 5	×	*By Bills Payable, No. 4*	80	00
		Balance [written in red]	3,159	16
			3,239	16
March 5	×	*Bills Payable, No. 1*	80	00
		No. 2	180	00
			260	00
		Balance [written in red]	2,899	16
			3,159	16
April 5	×	*Bills Payable, No. 3*	120	00
April 7	17	*Protested Note, A. Daniel*	61	60
April 8	×	*Rent*	160	00
April 8	×	*Tax*	40	48
April 8	×	*Tax*	30	40
			412	48
		Balance [written in red]	2,559	08
			2,971	56

CASH BOOK—SINGLE ENTRY. All moneys paid out are entered on this page and posted to the Dr. side of Ledger and folio entered in column at left. These pages should be written up on properly ruled paper like the script cash pages preceeding.

FOLIO 10

E. J. White

Dr.							Cr.						
Jan.	2	Cash	3	160	00	Jan.	1	Day Book	1	300	40
Jan.	2	Bills Payable, No. 1		80	00						
June	30	Balance		60	40						
				300	40					300	40
						June	30	Balance		60	40

FOLIO 12

Harry Short

Dr.							Cr.						
Jan.	2	Cash	3	240	00	Jan.	1	Day Book	1	482	00
Jan.	2	Bills Payable, No. 2		180	00						
June	30	Balance		62	00						
				482	00					482	00
						June	30	Balance		62	00

FOLIO 13

Mrs. Pearl Cook

Dr.							Cr.						
Jan.	3	Cash	3	300	00	Jan.	1	Day Book	1	600	00
Jan.	2	Bills Payable, No. 3		120	00						
June	30	Balance		180	00						
				600	00					600	00
						June	30	Balance		180	00

FOLIO 14

Ralph Wilson

Dr.							Cr.						
Jan.	2	Cash	3	122	00	Jan.	1	Day Book	1	248	60
Jan.	2	Bills Receivable, No. 4		80	00						
June	30	Balance		46	60						
				248	60					248	60
						June	30	Balance		46	60

FOLIO 15

M. Young

Dr.							Cr.						
Jan.	5	Bills Receivable, No. 2 and 3		210	24	Jan.	1	Day book	1	397	28
June	30	Balance		187	04						
				397	28					397	28
						June	30	Balance		187	04

FOLIO 16

Jones & Co.

Dr.							Cr.						
Jan.	3	Goods		144	80	Jan.	3	Cash		72	40
								Bills receivable, No. 1		72	40
				144	80	June	3			144	80

Folio 17

Dr. **A. Daniel** **Cr.**

Jan.	3	Merchandise	1	101	60	Jan.	3	Cash	2	40	00
				101	60	June	3	Bills Receivable, No. 2		61	60
June	30	Note Protested	3	61	60					101	60

Folio 18

Dr. **Bowers & Co.** **Cr.**

Jan.	5	Merchandise	1	148	64	Jan.	5	Bills Receivable, No. 3		148	64
				148	64					148	64

Folio 19

Dr. **W. Henderson** **Cr.**

Jan.	5	To Merchandise	1	164	60	Jan.	5	Day Book	1	240	00
June	30	Balance		75	40					240	00
				240	00	June	30	Balance		75	40

Folio 20

Dr. **Mackey & Co.** **Cr.**

Jan.	3	Merchandise	1	40	00	June	1	Bills Receivable, No. 4		40	00
				40	00					40	00

Folio 21

Dr. **M. H. Smith** **Cr.**

May	1	Merchandise	1	36	48	June	1	Bills Receivable, No. 5		36	48
				36	48					36	48

Folio 22

Dr. **A. M. Jenks** **Cr.**

May	1	Merchandise	1	160	00	June	1	Note, Bills Receivable, No. 6		160	00
				160	00					160	00

Folio 23

Dr. **E. Solly** **Cr.**

May	1	Merchandise	1	240	00	June	1	Bills Receivable, No. 7		240	00
				240	00					240	00

Folio 24

F. M. Johnson

Dr.						Cr.					
May	1	Merchandise	1	148	40	June	1	Bills Receivable, No. 8		148	40
				148	40					148	40

Folio 25

Gerhart & Co.

Dr.						Cr.					
June	30	Bills Payable, No. 5		104	40	June	20	Goods as per Invoice	1	104	40
				104	40					104	40

Folio 26

Woolson, Williams & Co.

Dr.						Cr.					
June	30	Bills Payable, No. 6		400	00	June	20	By Goods	1	400	00
				400	00					400	00

Folio 27

George Page

Dr.						Cr.					
June	30	Bills Payable, No. 7		348	80	June	20	By Goods, per Day Book	1	348	80
				348	80					348	80

Folio 28

D. Adams

Dr.						Cr.					
June	30	Bills Payable, No. 8		341	60	June	20	By Goods		341	60
				341	60					341	60

June 30, 19 —Balance Sheet—

Dr.						Cr.			
FOLIO IN LEDGER		BALANCE AS PER LEDGER		FOLIO IN LEDGER		BALANCE AS PER LEDGER			
	Cash on Hand	2,559	08	10	E. J. White	60	40		
	Notes Due	624	88	12	Harry Short	62	00		
	Protested Note	61	60	13	Mrs. Pearl Cook	180	00		
	Stock Estimated at			14	Ralph Wilson	46	60		
	by Inventory	2,308	16	15	M. Young	187	04		
				19	W. Henderson	75	40		
					Notes Payable	1,194	80		
						1,806	24		
					Balance	3,747	48		
		5,553	72			5,553	72		
	June 30, Balance	3,747	48						

—Bills Receivable—

FOLIO	NUMBER OF BILL	ON WHOSE ACCOUNT	DATE	TIME	DUE	AMOUNT
16	1	*Jones & Co.*	*Jan. 3*	*3 mos.*	*April 6*	72.40
17	2	*A. Daniel*	*Jan. 5*	*2 mos.*	*March 8*	61.60
18	3	*Bowers & Co.*	*Jan. 5*	*2 mos.*	*March 8*	148.64
						282.64
20	4	*Mackey & Co.*	*June 1*	*3 mos.*	*Sept. 4*	40.00
21	5	*M. H. Smith*	*June 1*	*3 mos.*	*Sept. 4*	36.48
22	6	*A. M. Jenks*	*June 1*	*3 mos.*	*Sept. 4*	160.00
23	7	*E. Solly*	*June 1*	*3 mos.*	*Sept. 4*	240.00
24	8	*F. M. Johnson*	*June 1*	*3 mos.*	*Sept. 4*	143.40
						624.88

—Bills Payable—

FOLIO	NUMBER OF BILL	BY WHOM DRAWN	DATE	TIME	DUE	AMOUNT
10	1	*E. J. White*	*Jan. 2*	*2 mos.*	*Mar. 5*	80.00
12	2	*Harry Short*	*Jan. 2*	*2 mos.*	*Mar. 5*	180.00
13	3	*Mrs. Pearl Cook*	*Jan. 2*	*3 mos.*	*April 5*	120.00
14	4	*Ralph Wilson*	*Jan. 2*	*1 mo.*	*Feb. 5*	80.00
						460.00
25	5	*Gerhart & Co.*	*June 30*	*3 mos.*	*Sept. 2*	104.40
26	6	*Woolson, Williams & Co.*	*June 30*	*3 mos.*	*Sept. 2*	400.00
27	7	*George Page*	*June 30*	*3 mos.*	*Sept. 2*	348.80
28	8	*D. Adams*	*June 30*	*3 mos.*	*Sept. 2*	341.60
						1,194.80

BILL BOOK. The above are two pages of a separate book known as the BILL BOOK. In this, under *Bills Receivable* are entered in regular order, the notes and paper which the owner receives in the course of business.

Under *Bills Payable* are entered in regular order the record of the notes given to others or any paper issued. Each note is entered with its number, the dates when it was drawn, when due, with time it has to run and the amount of its face, together with name of parties signing which are known as the maker or makers of the notes. The folio at the left indicates where the account is found in the Ledger; each item in this book must appear in the Ledger. Bills Receivable appear on the *Cr.* side of Ledger and Bills Payable on *Dr.* side. The BILL BOOK is an important one to the business man and he should be careful in making his entries. He should refer to it daily to see what paper he has to pay and arrange therefor; also to see what paper becomes due and see that it is presented for payment at proper time and place. He must remember that if a note is made payable in a bank it must be there before the appointed time so that, if not paid by the maker, the endorser may be notified and held by a protest. If such notice be not given by proper officer the endorser can not be held. On the other hand, if you overlook time of payment for your own note (Bills Payable) and it goes to protest it causes annoyance and, if repeated, injuries your credit.

January 1, 190-

LF			Dr.	Cr.
12	Mdse.		163 00	
13		E. J. White		300 40
14		Harry Short		482 00
15		Mrs. P. Cook		600 00
16		Ralph Wilson		248 60
13	E. J. White		80 00	
14	Harry Short		180 00	
15	Mrs. Pearl Cook		120 00	
16	Ralph Wilson		80 00	
17		Bills Pay.		460 00
12	Mdse.		397 28	
19		M. Young		397 28
20	Jones & Co.		144 80	
12		Mdse.		144 80
18	Bills Rec.		72 40	
20		Jones & Co.		72 40
21	A. Daniel		101 60	
12		Mdse.		101 60

JOURNAL—DOUBLE ENTRY. This page should be studied and copied as it is a model for penmanship, arrangement and ruling All horizontal lines are in black. Central vertical line is a faint blue one.

Folio 12.

Dr. Merchandise. Cr.

190-						190-					
Jan	1	To Sundries	1	1631	00	Jan	1	By Cash	1	29	60
"	2	" M. Young	1	397	28	"	3	" Jones & Co.	1	144	80
"	3	" Jones & Co.	1	72	40	"	3	" A Daniel	1	101	60
"	5	" W Henderson	2	240	00	"	5	" Bowers & Co	2	148	64
June	20	" Sundries	2	1194	80	"	5	" W Henderson	2	164	60
						"	5	" Cash	2	13	20
						May	1	" Bills Rec	3	624	88
						*June	30	" Balance		2308	16
				3535	48					3535	48
July	1	To Balance		2308	16						

Folio 17

Dr. Bills Payable. Cr.

190-						190-					
Jan	5	To Cash	1	80	00	Jan	1	By Sundries	1	460	00
"	5	" "	1	80	00	Apl	1	" "	3	1194	80
"	5	" "	1	180	00						
"	5	" "	1	120	00						
*June	30	" Balance		194	80						
				1654	80					1654	80
						July	1	By Balance		1194	80

LEDGER—DOUBLE ENTRY. This page should be studied and copied as it is a model for penmanship, arrangement and ruling. All horizontally and diagonally ruled lines are in *red*

Dr. —*Cash*—

DATE	FOLIO IN LEDGER			
Jan. 1	11	*Capital, cash invested in the business*	4,000	00
Jan. 2	12	*Cash for sundry sales this day*	29	60
Jan. 3	21	*A. Daniel, payment on account*	40	00
Jan. 4	12	*Cash for sundry sales*	13	20
			4,082	80
Jan. 1	✓	*To Balance*	3,239	16
March 1	×	*To Balance*	3,159	16
April 1	×	*To Balance*	2,899	16
	18	*Bills Receivable, No. 1*	72	40
			2,971	56
June 30		*Balance*	2,559	08

CASH BOOK—DOUBLE ENTRY. All moneys received are entered on this page and posted to the Cr. column of Ledger and folio entered in column at left.

—*Cash*— *Cr.*

DATE	FOLIO IN LEDGER			
Jan. 2	13	*E. J. White*	160	00
	14	*Harry Short*	240	00
	15	*Mrs. Pearl Cook*	300	00
	16	*Ralph Wilson*	122	00
	33	*Expenses*	21	64
			843	64
		Balance [written in red]	3,239	16
			4,082	80
Jan. 5	17	*By Bills Payable, No. 4*	80	00
		Balance [written in red]	3,159	16
			3,239	16
March 5	17	*Bills Payable, No. 1*	80	00
	17	*No. 2*	180	00
			260	00
		Balance [written in red]	2,899	16
			3,159	16
April 5	17	*Bills Payable, No. 3*	120	00
April 7	21	*Protested Note, A. Daniel*	61	60
April 8	×	*Rent*	160	00
April 8	×	*Tax*	40	48
April 8	×	*Tax*	30	40
			412	48
		Balance [written in red]	2,559	08
			2,971	56

CASH BOOK—DOUBLE ENTRY. All moneys paid out are entered on this page and posted to the Dr. side of Ledger and folio entered in column at left. These pages should be written up on properly ruled paper like the script cash pages.

January 1, 190–.

L. F.			Dr.		Cr.	
12	*Merchandise*		1631	00		
13		*E. J. White*			300	40
14		*Harry Short*			482	00
15		*Mrs. Pearl Cook*			600	00
16		*Ralph Wilson*			248	60
	2					
13	*E. J. White*		80	00		
14	*Harry Short*		180	00		
15	*Mrs. Pearl Cook*		120	00		
16	*Ralph Wilson*		80	00		
17		*Bills Payable*			460	00
	//					
12	*Merchandise*		397	28		
19		*M. Young*			397	28
	3					
20	*Jones & Co.*		144	80		
12		*Merchandise*			144	80
	//					
12	*Merchandise*		72	40		
20		*Jones & Co.*			72	40
	//					
18	*Bills Receivable*		72	40		
20		*Jones & Co.*			72	40
	//					
21	*A. Daniel*		101	60		
12		*Merchandise.*			101	60
	//					
18	*Bills Receivable*		61	60		
21		*A. Daniel*			61	60
	5					
22	*Bowers & Co.*		148	64		
12		*Merchandise*			148	64
	//					
19	*M. Young*		210	24		
18		*Bills Receivable*			210	24
	//					
12	*Merchandise*		240	00		
23		*W. Henderson*			240	00

THE JOURNAL—DOUBLE ENTRY

January 5, 190–

L. F.			Dr.		Cr.	
18	*Bills Receivable*		148	64		
22		*Powers & Co.*			148	64
		5				
23	*W. Henderson*		164	60		
12		*Merchandise*			164	60
		May 1				
24	*Mackey & Co.*		40	00		
25	*M. H. Smith*		36	48		
26	*A. M. Jenks*		160	00		
27	*E. Solly*		240	00		
28	*F. M. Johnson.*		148	40		
12		*Merchandise*			624	88
		June 1				
18	*Bills Receivable*		624	88		
24		*Mackey & Co.*			40	00
25		*M. H. Smith*			36	48
26		*A. M. Jenks*			160	00
27		*E. Solly*			240	00
28		*F. M. Johnson*			148	40
		20				
12	*Merchandise*		1194	80		
24		*Gerhart & Co.*			104	40
30		*Woolson, Williams & Co.*			400	00
31		*George Puge*			348	80
32		*D. Adams*			341	60
		30				
24	*Gerhart & Co.*		104	40		
30	*Woolson, Williams & Co.*		400	00		
31	*George Page*		348	80		
32	*D. Adams*		341	60		
17		*Bills Payable*			1194	80
		31				
34	*Loss and Gain*		252	52		
33		*Expenses Account*			252	52

THE JOURNAL—DOUBLE ENTRY. Each item must be entered twice in the Ledger. Hence the name *double entry*. The Journal provides for this by a double column for dollars and cents, one representing the *Dr.* and the other *Cr.* entry in the Ledger. The folio numbers of the Ledger are entered at the left. The first date is at top of the page and each succeeding date follows in its place in centre of page. Each entry in Journal is followed by a broken ruled line. The vertical ruled line serves to divide the *Dr.* from *Cr.* items. Where several items are charged to one account the sum total only is placed against said item, as in first entry. Footings in lead pencil should be made of each dollars' and cents' column of Journal page to test accuracy, as these totals must agree.

Folio 10

Dr. Cash Cr.

Jan.	2	To Capital Account	1	4000	00	June	30	By Disbursements		1596	12
Jan.	2	" Hand		155	20			" Balance		2559	08
				4155	20					4155	20
June	30	To Balance		2559	08						

Folio 11

Dr. Capital Account Cr.

						Jan.	1	By Cash		4000	00

Folio 12

Dr. Merchandise Cr.

Jan.	1	To Sundries	1	1631	00	Jan.	1	By Cash	1	29	60
"	2	" "	1	397	28	"	3	" Jones & Co.	1	144	80
"	3	" "	1	72	40	"	3	" A. Daniel	1	101	60
"	5	" "	1	240	00	"	5	" Bowers & Co.	1	148	64
June	20	" "	2	1194	80	"	5	" W. Henderson	2	164	60
						June	5	" Cash	1	13	20
						May	1	" Sundries	2	624	88
						June	30	" Balance		2308	16
				3535	48					3535	48
June	30	To Balance		2308	16						

Folio 13

Dr. E. J. White Cr.

Jan.	2	To Bills Payable	2	80	00	Jan.	1	By Merchandise	1	300	40
Jan.	2	" Cash	2	160	00						
June		" Balance		60	40						
				300	40					300	40
						June	30	By Balance		60	40

Folio 14

Dr. Harry Short Cr.

Jan.	2	To Bills Payable	1	180	00	Jan.	1	By Merchandise	1	482	00
Jan.	2	To Cash	2	240	00						
June		To Balance		62	00						
				482	00					482	00
						June	30	By Balance		62	00

Folio 15

Dr. — *Mrs. Pearl Cook* — *Cr.*

Jan.	2	*To Bills Payable*	1	120	00	*Jan.*	1	*By Merchandise*	1	600	00
Jan.	2	" *Cash*	2	300	00						
June		" *Balance*		180	00						
				600	00					600	00
						June	30	*By Balance*		180	00

Folio 16

Dr. — *Ralph Wilson* — *Cr.*

Jan.	2	*To Bills Payable*	1	80	00	*Jan.*	1	*By Merchandise*	1	248	60
Jan.	2	" *Cash*	2	122	00						
June		" *Balance*		46	60						
				248	60					248	60
						June	30	*By Balance*		46	60

Folio 17

Dr. — *Bills Payable* — *Cr.*

Jan.	5	*To Cash*	2	80	00	*Jan.*	2	*By Sundries*	1	460	00
Mar.	5	" "	2	80	00	*June*	30	" *Sundries*	2	1194	80
April	5	" "	2	180	00						
"	5	" "	2	120	00						
		" *Balance*		1194	80						
				1654	80					1654	80
						June	30	*By Balance*		1194	80

Folio 18

Dr. — *Bills Receivable* — *Cr.*

Jan.	3	*To Jones & Co.*	1	72	40	*Jan.*	1	*By M. Young*	1	210	24
"	3	" *Cash*	2	61	60	*April*	1	" *Cash*	1	72	40
"	5	" *Bowers & Co.*	2	148	64	*June*	30	" *Balance*		624	88
June	1	" *Sundries*	2	624	88						
				907	52					907	52
June	30	*To Balance*		624	88						

Folio 19

Dr. — *M. Young* — *Cr.*

Jan.	5	*To Bills Receivable*	1	210	24	*Jan.*	1	*By Merchandise*	1	397	28
		" *Balance*		187	04						
June	30			397	28					397	28
						June	30	*By Balance*		187	04

Folio 20

Dr. **Jones & Co.** *Cr.*

Jan.	3	*To Merchandise*	1	144	80	*Jan.*	3	*By Bills Receivable*	1	72	40
								" *Cash*	1	72	40
				144	80	*Jan.*	3			144	80

Folio 21

Dr. **A. Daniel** *Cr.*

Jan.	3	*To Merchandise*	1	101	60	*Jan.*	3	*By Bills Receivable*	1	61	60
April	7	" *Protested Note*	2	61	60	*June*	3	" *Cash*	1	40	00
June	30							" *Balance*	1	61	60
				163	20					163	20
		To Balance		61	60						

Folio 22

Dr. **Bowers & Co.** *Cr.*

Jan.	5	*To Merchandise*	1	148	64	*Jan.*	5	*By Bills Receivable*	2	148	64
				148	64					148	64

Folio 23

Dr. **W. Henderson** *Cr.*

Jan.	5	*To Merchandise*	2	164	60	*Jan.*	5	*By Merchandise*	1	240	00
June	30	" *Balance*		75	40						
				240	00					240	00
						June	30	*By Balance*		75	40

Folio 24

Dr. **Mackey & Co.** *Cr.*

May	1	*To Merchandise*	2	40	00	*June*	1	*By Bills Receivable*	2	40	00
				40	00					40	00

Folio 25

Dr. **M. H. Smith** *Cr.*

May	1	*To Merchandise*	2	36	48	*June*	1	*By Bills Receivable*		36	48
				36	48					36	48

Folio 26

Dr. *A. M. Jenks* *Cr.*

May	1	*To Merchandise*	2	160	00	*June*	1	*By Bills Receivable*	2	160	00
				160	00					160	00

Folio 27

Dr. *E. Solly* *Cr.*

May	1	*To Merchandise*	2	240	00	*June*	1	*By Bills Receivable*	2	240	00
				240	00					240	00

Folio 28

Dr. *F. M. Johnson* *Cr.*

May	1	*To Merchandise*	2	148	40	*June*	1	*By Bills Receivable*	2	148	40
				148	40					148	40

Folio 29

Dr. *Gerhart & Co.* *Cr.*

June	30	*To Bills Payable*	2	104	40	*June*	20	*By Merchandise*	2	104	40
				104	40					104	40

Folio 30

Dr. *Woolson, Williams & Co.* *Cr.*

June	30	*To Bills Payable*	2	400	00	*June*	20	*By Merchandise*	2	400	00
				400	00					400	00

Folio 31

Dr. *George Page* *Cr.*

June	30	*To Bills Payable*	2	348	80	*June*	20	*By Merchandise*	2	348	80
				348	80					348	80

Folio 32

Dr. *D. Adams* *Cr.*

June	30	*To Bills Payable*	2	341	60	*June*	20	*By Merchandise*	2	341	60
				341	60					341	60

FOLIO 33

Dr. *General Expense* *Cr.*

Jan.	6	*To Cash*		21	64	*June* 30	*By Sundries*	252	52
April	8	" "		160	00				
"	8	" "		40	48				
"	8	" "		30	40				
				252	52			252	52

FOLIO 34

Dr. *Loss and Gain* *Cr.*

June	30	*To Sundries*		252	52		*By Balance*	252	52
		Balance		252	52				

LEDGER—DOUBLE ENTRY

June 30, 19 —*Balance Sheet*—

Dr. *Cr.*

FOLIO IN LEDGER		BALANCE AS PER LEDGER			FOLIO IN LEDGER		BALANCE AS PER LEDGER		
10	*Cash on Hand*	2,559	08		11	*Capital*	4,000	00	
12	*Merchandise*	2,308	16		13	*E. J. White*	60	40	
18	*Bills Receivable*	624	88		14	*Harry Short*	62	00	
21	*A. Daniel*	61	60		15	*Mrs. Pearl Cook*	180	00	
34	*Loss and Gain*	252	52		16	*Ralph Wilson*	46	60	
					18	*Bills Payable*	1,194	80	
					19	*M. Young*	187	04	
					23	*W. Henderson*	75	40	
		5,806	24				5,806	24	

Explanation—Double-Entry Bookkeeping.

In the single-entry bookkeeping, it will be remembered, there is only one record, whereas in double-entry each item appears twice, once as *debit* and again as *credit*; also in the former, cash, stocks, goods, etc., did not appear as individual accounts, whereas in double-entry each of these is made an individual account. As it takes two parties to make a transaction, so in the *Ledger* it requires two entries, one for each party, to be made; for example, the *Journal* shows that *Merchandise* is debtor to four items, $1631.00. Turning to the *Ledger*, folio 12, we will find $1631.00 entered on the debtor side of the *Merchandise* account, and in folios 13-14-15 and 16, we shall find the four items entered under their respective accounts, which together exactly balance the $1631.00; or, if the transaction be a cash transaction, and cash is paid out, as in the *Cash Book* on the credit side the item "E. J. White, $160.00," this item appears on the debtor side of one account, folio 13, and on the credit side of *Cash* account, folio 10, under the sum total of "Disbursements." These two examples suffice to show how in double-entry bookkeeping every item must appear twice in the *Ledger*, once on the debtor side and once on the credit side; consequently, if every entry is made properly and accurately, the sum total of the entries on the debtor side of the *Ledger* must equal the sum total of the entries on the credit

side of the *Ledger*. The student should first carefully trace every item of the *Journal* and *Cash Book* to its proper place in the *Ledger*, afterwards write up a set of books for himself, copying, on properly ruled paper, the set as printed in this book, using the rulings indicated by the model script pages for each book, where the ruling has been accurately made. Afterwards, turning back, endeavor to write up the trial list of transactions into a set of double-entry accounts.

Journal.—We have reproduced a model page of the *Journal* which differs from the single-entry only in slight particulars. It is more properly a *Journal* than a *Day Book*, as it is used to indicate by the entries which side of the *Ledger* each item is to be posted, whereas the *Day Book* is a mere history of the daily transactions, without arranging the items with reference to their being posted to the *Ledger*. In journalizing the bookkeeper should have clearly in his mind which is the debit and which is the credit item, beginning his entry always and uniformly with the debit item; for instance, "Merchandise, Debtor to E. J. White." The word "debtor" is not expressed in the *Journal*, the debit item being to the left and the credit item to the right. Debit amount in the first column and credit amount in the second column.

Cash Book.—The *Cash Book* in double-entry is in all particulars the same in form as that of single-entry. (Compare the script pages.) It is to be remembered that the item entered in Cash on the debtor side appears on the credit side of the *Ledger* account to that particular item, and the second entry will be accounted for in the *Cash Account* of the *Ledger*. It is important in receiving cash to enter it at the time received in the *Cash Book*, on the debtor side, and under the name of the account to which it is to be posted in the *Ledger;* for instance, A. Daniel pays his account, $40.00. The cash entry is "A. Daniel, Payment on Account $40.00." It is customary in business to classify the receipts under one or two general accounts, and open in the *Ledger* only such accounts as are desired to keep a record of; hence such entries as "Cash for Sundry Sales" indicate that these will be accounted for in the *Ledger* in the *Cash Account*. Where there are two or three sources from which moneys are received, which are necessary to be posted, the *Cash* contains a separate dollar and cents ruling at the right for each: hence some Cash Books have as many as four or five rulings for dollars and cents, and at the top of each ruling is indicated the name of the account, as *Rents*, *Hardware*, *Groceries*, *etc.* And on the credit side the money paid out may be for such accounts as *Postage*, *Taxes*, *Freights*. At the end of each month these columns should be added and the totals posted to their respective accounts in the *Ledger*. This is a very convenient form, and easily understood.

Red ink should be sparingly used in bookkeeping, and when used it should be uniformly done. It is customary in the *Cash Book* to rule all horizontal lines in red, and on the credit side the word "Balance" and the amount opposite to it are written in red, but brought down on the debit side in black. Note the ruling in the *Cash Book*, in the model pages. It will be seen that the single horizontal line extends only across one column, the double horizontal line across two columns.

Ledger.—What has been said in the single-entry as to the arrangement of the accounts on the pages of the *Ledger* applies also to the double entry. The ruling also is, in the main, the same in both. It will be remembered that in the double-entry bookkeeping we have such accounts as *Cash*, *Capital Account*, *Merchandise*, *Bills Payable*, *and Bills Receivable*, which did not appear in the single-entry. The *Cash* account, folio 10, is debtor to the *Capital* account $4,000.00, and the *Capital* account is credited "By Cash $4,000.00." The *Cash* account is credited "By Disbursements" as indicated on the credit side of the *Cash Book*. It is debited again by the amount of cash on hand at the time of closing the books, giving a balance of $2,559.08, which is entered on the credit side, which closes the account, and appears again on the debit side when the account is again opened. *Merchandise*, folio 12, is debited "To Sundries," which means that there are several items, the total of which is $1631.00, or whatever the amount is written opposite the word, and it is credited "By" several individual accounts,

the folio number being entered in the column prepared for that purpose. Each of these items should be accounted for in some one of the other accounts.

In *Bills Payable* account on the debit side are posted the amounts of notes paid out and which are our obligations to pay. When paid each is entered on the debit side of Cash as Bills Payable and posted to credit side of Bills Payable account, thus balancing each note. The face amounts of the notes must always be posted in full on either side of the Bills Payable account, and any discount or interest will be charged or credited as the case may be to Interest and Discount Accounts.

Closing Books.—In closing the books at any given period we rule off all personal accounts and bring the balance down in red ink; if our debtor, the account will appear first on the credit side in red ink "*By Balance*" then transfer to the debit side "*To Balance*"; if our creditor, the reverse of the above operation. In closing loss and gain accounts and personal accounts uncollected (which become Loss and Gain accounts) we charge them to Loss and Gain account. But it should be understood that personal accounts are not in fact Loss and Gain accounts, as they could be charged to Merchandise account with the same result, as the profit from the sale of our goods would be lessened to the extent of our bad accounts, as "To Jones & Co. $72.40" is a note received from them, posted from the *Journal;* on the credit side "April 1, By Cash $72.40" is posted through *Cash* when the note was paid. Whenever notes are taken the parties giving them must be *credited* and the *Bills Receivable debited*. When notes are given the parties receiving them must be *debited* and the *Bills Payable credited*. When cash is paid out *Cash* must be *credited* and whatever is paid out must be *debited*.

In *Loss and Gain* account the credit side shows when there is a gain in business, and the debit side shows when there is a loss in business. The *Loss and Gain* account is the account where all bad debts must be charged by transferring them from the individual accounts, through the *Journal*, into the *Loss and Gain* account.

In order to see that our entries and postings have been right, the following method must be followed, which is called "balancing the books:"

Balancing Books.—Balance each individual account, strike a balance, which is done by entering the difference of the two sides of the account on the side requiring an addition to make it equal to the other side, draw two horizontal lines under the sum totals, which are placed on exactly the same line of the page, and bringing down on the opposite side "Balance" with its amount. This will be seen in looking at any of the accounts in the *Ledger*. After this has been done, take all those balances which appear on the debit side of your *Ledger* and add them together. Do the same on the credit side, and if the two sums are equal to each other your books are correct; however, to give positive proof, after the totals of both sides have agreed, see that they agree and are equal with those of the *Journal*. This will give you a double sure proof that your books are correct. The items standing on the debit side of your trial balance sheet should be *Cash in Hand*, *Accounts Receivable*, *Notes Receivable*, *Equipments* and *Stock Inventory*, and on the credit side should appear your *Liabilities*, *Notes Payable*, *Profit and Loss*, if you have made a gain in your business; otherwise *Profit and Loss* will stand on the debit side.

The balance sheet for the Single-entry will be found on previous page, which shows that there has been a loss of $252.52, which is the difference between the $4000.00 started with and the balance, $3747.45, with which we close business. This is a little over 6 per cent. loss. Had the balance been $4210.00 there would have been a profit of $210.00. On the balance sheet for the Double-entry it will appear that there has been a loss of $252.52, as entered in the *Loss and Gain* account.

VOCABULARY OF BUSINESS TERMS

Acceptance.—Agreeing to the terms proposed; the acceptor's name written on the face of a bill of exchange or draft, usually with the word "Accepted."

Accommodation Paper.—Notes or acceptances drawn for the purpose of being discounted, and not founded on an actual sale of goods.

Account Current.—A running account. A detailed statement of the transactions between two persons or firms.

Account Sales.—An itemized statement of sales and expenses, sent by a commission merchant to his principal.

Actuary.—A registrar; a clerk; a person skilled in the application of the doctrine of chances to financial affairs, more especially to insuring of lives.

Adjust.—To put in order; to bring to a satisfactory state, so that parties can agree.

Administrator.—One that is appointed by the court to settle an estate.

Affidavit.—A written declaration under oath.

Agent.—A party acting on behalf of another, called his principal; one commissioned to do business for another; a factor.

Annuity.—A periodical payment of money, amounting to a fixed yearly sum.

Arbitration.—The adjustment of a disputed point by a person or persons chosen by the parties in dispute.

Assessment.—A call upon the holders of stock or policies to pay into the treasury a certain sum in order to pay off debts or effect a re-organization.

Assets.—Funds, property, or effects; the stock in trade, cash, and all the available property of a merchant, in contradistinction to his liabilities or obligations.

Assignee.—A person to whom the property of a bankrupt or an insolvent debtor is transferred for the benefit of creditors.

Assignment.—The act of transferring property to the assignee,

Attachment.—A legal writ for the purpose of seizing a man's property.

Auditor.—An officer appointed to examine and verify claims upon the treasury of a company or society and to investigate the treasurer's accounts.

Balance of Trade.—The difference between the value of our commercial imports and exports.

Bankrupt.—One unable to pay his debts, and takes advantage of the bankrupt law.

Bear.—A person whose interest it is to secure lower prices.

Bill of Exchange.—An order for the payment of money, usually drawn on a person living in a foreign country, *draft* being used to designate bills that are payable in the same country in which they are drawn.

Bill of Lading.—A written account of goods shipped, and the conditions of shipment, having the signature of the carrier's agent, and given the shipper as a receipt.

Bill of Sale.—A writing given by the seller to the buyer, transferring the ownership of personal property.

Bond.—An instrument under seal, by which the maker binds himself, and usually his heirs, executors, and administrators, to do or not to do a specified act. A certificate of ownership of a specified portion of a capital debt due by a government, a city, a railroad, or other corporation, to individual holders, and usually bearing a fixed rate of interest.

Bonded Goods.—Those which are stored in a bonded warehouse, or in bonded cars, the owner having given bonds securing the payment of import duties or of internal revenues, upon their removal or their arrival in some inland city of entry, and before a specified time.

Bonus.—A premium given on a loan, or for any favor shown.

Broker.—An agent who effects sales or purchases, or who makes loans and contracts for another.

Bucket Shop.—A place where bets are made on quotations of prices established on legitimate exchanges and boards of trade. Pretended trading. Illegal in most States. Recently taxed by Revenue Law.

Bull.—A person whose interest it is to secure higher prices.

Bulling.—Raising the price of stocks, etc.

Call Loans.—Money loaned subject to the call or demand of lender. It must be

returned the day it is called for before the close of banking hours.

Capital.—The investment in business.

Cash Sales.—The sales made for ready money, in contradistinction to sales on which credit is given.

Certificate.—A written voucher attesting to some fact; as a certificate of deposit, a certificate of stock.

Certified Check.—One which has been certified or accepted by the bank on which it is drawn, making the bank responsible for its payment.

Charter.—A paper from government, defining the rights and privileges of corporations.

Chattel Mortgage.—A mortgage of personal property.

Clearing House.—A kind of banking exchange, established in some of the large cities for the convenience of daily settlements; the drafts and checks on each other are mutually exchanged without the individual presentation of each at the banks, and a balance struck, which balance only is paid in cash.

Collaterals.—Pledges of stocks, notes, chattels, for security of loans and other indebtedness.

Commercial Paper.—Bills of exchange, drafts, and notes given in course of trade.

Commission.—A percentage given for the sale or purchase of goods, or the transaction of other business.

Company.—A corporation. A term also used in a firm name to designate other partners, whose names are not given.

Consignee,—One to whom goods are sent.

Copartnership.—A joining of two or more persons into one firm for the purpose of carrying on any enterprise. It has the same meaning as a partnership.

Corner.—An artificial scarcity created by holding property off the market for the extortion of abnormally high prices.

Coupon.—An interest note or a certificate attached to a transferable bond, cut off from the bond and collected when due.

Creditor.—One giving credit; one whom we owe.

Custom-House.—A government place where imported goods are entered and duties collected.

Days of Grace.—Negotiable promissory notes or bills of exchange, payable at a certain time, are in most places entitled to three days' delay beyond the time expressed, which are called days of grace.

Debenture.—A writing acknowledging a debt; a writing signed by a public officer or corporation as evidence of debt.

Debenture Bonds.—Concentration of floating capitalization into convenient bonded form. Originally, notes in the form of bonds.

Deed.—A written contract under seal, usually transferring the ownership of real estate.

Defalcation.—Deduction or discount. Embezzlement of money by an officer having it in charge.

Default.—The failure to pay fixed charges or interest coupons. This is a serious thing for a corporation, and usually causes a heavy shrinkage in value.

Discount.—An amount deducted from the regular price or list.

Discount Rate,—The rate per cent. of interest charged by banks for the use of money loaned. It is always deducted from the principal when the loan is made.

Dishonor.—A failure to pay an obligation when due; a failure to accept a draft when presented for acceptance.

Dividend.—The proportion of the profits alloted to each stockholder in a company.

Executor.—One appointed to execute the will of another.

Exporting Countries.—Those producing a surplus of grain which finds a market in other countries where there is a deficiency. The principal ones are the United States, Russia, Argentina, Hungary, India, Roumania, and Australia.

Extension.—An allowance of further time for the payment of a debt.

Falling Market.—A continuous decline in prices.

Favor.—A note, draft, or check is drawn in favor of the party to whom it is made payable; a letter.

Fee Simple.—The absolute ownership of real estate.

F. O. B.—Free on board or free of all shipping expenses.

Good Will.—The reputation and patronage belonging to an established business. The good will of a business is frequently the subject of purchase and sale.

Honor.—To accept or pay draft when due.

Hypothecating.—Putting up collaterals for loans.

Importing Countries. — The United Kingdom, Germany, France, Italy, Belgium, Holland, Spain, Brazil, the West Indies, China, and Japan, because they produce less grain than is required for home consumption.

Insolvency.—Inability to pay debts or meet commercial obligations.

Insolvent.—Unable to pay one's debts; one who is insolvent.

Inventory.—A schedule or list of the goods, wares and merchandise generally, credits and assets of a merchant.

Invoice.—An itemized bill of merchandise bought, sold or shipped.

Jobber.—A wholesale merchant who buys goods from the importers and manufacturers, and sells to retailers.

Judgment.—The decree of a court enforcing a contract or redressing a wrong.

Liabilities.—The pecuniary obligations of a merchant, which include bills payable and all other debts.

Margin.—Money or collaterals deposited with a broker to protect contracts.

Mortgage.—The written pledge of real estate or chattels to secure payment.

Negotiable.—A term applying to commercial paper, that may be transferred by indorsement or simply by delivery.

Net Proceeds.—The proceeds of a sale after all expenses are deducted.

On Call.—Money loaned "on call" must be returned the day it is called for, before the close of banking hours, and without previous notice.

Open Account.—An unsettled account.

Option.—Property bought or sold at the call or demand of the buyer or seller, as may be specified; a conditional contract.

Outlawed.—Term applied to a debt or note which has run beyond the time when payment can be enforced by law.

Outstanding.—Unsettled; unpaid.

Overdrawn.—To draw a greater sum than one has to his credit.

Par Value.—Nominal value; usually the printed or written value of any paper.

Power of Attorney.—A written instrument giving an agent authority to act for his principal. An agent thus empowered is called an Attorney in Fact.

Protest.—A formal declaration made by a notary public of the non-payment, non-acceptance of a note or a draft.

Receiver.—A person appointed to take charge of the affairs of a corporation on its dissolution, and to distribute its property according to law.

Resources.—Money, property, or that which can be converted into property.

Renewal of a Note.—Extending the time of its payment by giving a new Note in exchange for it.

Sinking Fund.—A sum of money set apart for the redemption of the debts of a corporation or government.

Solvent.—Able to pay one's liabilities.

Spot Cash.—A term applied to a sale of goods to be paid for on delivery, *i. e.*, C. O. D.

Stock.—Certificates issued by a corporation certifying that the person in whose name they are written and stand registered on the corporation books is entitled to share in the company's profits, to vote, etc.

Syndicate.—A number of capitalists who unite together to dispose of a large loan, or to conduct some great financial enterprise.

Trade Discount.—A discount from certain list-prices, or from the amount of purchases, made to a dealer on account of a change in the prices, or for cash payments.

Trust.—A combination of manufacturers or dealers for the purpose of limiting production and advancing prices for their own benefit.

Valid.—A term applied to a contract that is properly executed; that is, legal or binding.

Void.—Having no legal or binding force.

Watered Stock.—An increase in capitalization without a corresponding increase in assets.

Without Recourse.—Not liable as an indorser if written over an indorser's signature on the back of commercial paper.

Warranty.—An agreement to become responsible, if certain facts do not turn out to be as represented.

RAPID CALCULATIONS

SHORT CUTS TO RESULTS—TIME-SAVING PROCESSES—
INTEREST TABLES AND WAGES CALCULATIONS—
HOW TO HANDLE FRACTIONS

QUICKNESS IN FIGURES

Book-keepers, bank clerks and others who have constant calculations to make need to be both expert and rapid. There are many short cuts practiced which every person should know, and a few of the most important are here explained.

Adding Quickly.

The art of adding quickly is acquired by learning to *read* a column of figures as you would a sentence of words, and those words composed of letters.

By *Practice* we may become so familiar with figures that when we see a group of them, we can tell at a glance what the sum of them reads, without spelling the figures at all. In practicing the reading of a column of figures in this way, we do not let the brain work at all, but simply pass the eye over the figures slowly at first, but increase the speed as proficiency is acquired.

A few minutes' daily practice will produce astonishing results in a very short time; beginning with two figures, then three, four, and so on until finally we become able to write the *Sum* total of long columns. For example, when we see the figures 9, 8, 6, 4, we know at a glance that the sum is 27 without reading the figures themselves or spelling them out.

Reading a column of figures is done by dividing a large group of figures into smaller ones and from group to group through the column, just as from word to word we read through a sentence.

The most important qualities of an accountant are accuracy and speed. The most speedy calculators are usually the most correct.

No labor should be regarded too great to master this, the key to all numerical as well as business transactions.

2. To multiply by numbers ending or beginning with 1; as 21, or 31, or 13, or 17, or 51, or 501, or 103, or any number of two figures where one of them is 1, or of three figures where two of them are 0 and 1, a good deal of time can be saved by abbreviating the ordinary process, as below:

RULE I. *When the 1 stands at the right*, multiply by the figure at its left, and place the product under the place of *tens* under the number to be multiplied. Add the two together, and their sum is the product.

If the multiplier is 201, or 301, or 401, or any number of hundreds, place the product two places to the left. *If the multiplier is* 2001, or any number of thousands, place the product three places to the left. In other words, the product of hundreds under hundreds' place; of thousands under thousands' place, etc.

RULE II. *When the 1 stands at the left of the multiplier*, multiply by the number at the right, and place the product under the multiplicand one place to the right of the

units' place. The second figure of the product under units' place of the multiplicand.

EXAMPLES. $231423 \times 21 = 4859883$.

$231423 = 231423 \times 1$

$4628460 = 231423 \times 20$

4859883 = product.

$20213 \times 13 = 262769$ = product.

$20213 \times 201 = 4062813$ = product.

EXAMPLES FOR PRACTICE. 2134×11; 6215×11; 2143×11; 3212×11; 4215×11; 2153×21; 1024×31; 8461×41; 2222×14; 3120×19; 2132×201; 2146×102; 9842×301; 8002×402; 4621×105.

3. Short Cuts in General Multiplication.

EXAMPLE 1. Multiply 96 by 97.

96 . . . 4 (Complement.)

97 . . . 3 (Complement.)

9312

The *complement* of a number is the difference between the number and the unit of the next higher order, thus the complement of 96 is 4 (100-96); of 97 is 3; of 987 is 13, etc. To multiply these two numbers, multiply the complements 4 and 3, and place the product, 12, in the answer. For the remaining two figures subtract across, either the 4 from the 97, leaving 93, or the 3 from the 96, leaving 93. Apply this rule to the first and second lines of exercises below.

EXAMPLE 2. Multiply 37 by 43.

The mean number—that is, the number which is as much greater than 37 as it is less than 43—is 40. Forty squared, or multiplied by itself, gives 1600. The square of 3, the difference between the mean number and one of the numbers is 9. 1600—9=1591=the product of 37 and 43. Apply this rule to the exercises below.

EXAMPLE 3. Multiply 76 by 46.

46 $6 \times 6 = 36$, carry 3.

76 $6 \times (7+4) = 6 \times 11 = 66$, and 3 carry 69.

3496 $4 \times 7 = 28$, and 6 to carry, 34.

Multiply units by units for the first figure of the product, the sum of the tens by units for the second figure, and tens by tens for the third figure, carrying when necessary. A similar rule applies to numbers having the left-hand figures the same. Work the following exercises.

EXERCISES. 97×98; 95×94; 97×96; 95×93; 93×97; 97×94; 99×89; 994×995; 993×994; 989×998; 992×995; 988×997; 976×999; 954×998; 87×73; 63×57; 42×38; 45×35; 116×124; 1012×988; 1025×975; 56×56; 72×32; 87×37; 61×63; 114×114; 137×177; 125×112.

4. Short Cuts in Multiplication and Division by Special Numbers.

To multiply any number by 25, add two ciphers, and divide the number by 4.

To multiply any number by 125, add three ciphers, and divide the number by 8.

To multiply a number by any number of *nines*, add as many ciphers to the number as there are *nines*, and from this subtract the original number.

5. Short Multiplication and Division in Fractional Numbers.

To multiply any number by $2\frac{1}{2}$, add one cipher, and divide by 4.

To multiply any number by $3\frac{1}{3}$, add one cipher, and divide by 3.

To multiply by $33\frac{1}{3}$, add two ciphers and divide by 3.

To multiply any number by $1\frac{3}{7}$, add one cipher, and divide by 7.

To multiply by $16\frac{2}{3}$, add two ciphers, and divide by 6.

To multiply by $14\frac{2}{7}$, add two ciphers, and divide by 7.

To multiply by 875, add three ciphers, multiply by 7 and divide by 8.

To divide by 25, multiply by 4, and cut off two figures.

To divide by 125, multiply by 8, and cut off three figures.

To multiply by $12\frac{1}{2}$, add two ciphers, and divide by 8.

To divide by $12\frac{1}{2}$, multiply by 8, and cut off two figures at the right.

To divide by $33\frac{1}{3}$ multiply by 3, and cut off two figures at the right.

Practical Applications.—To find the value of any number of articles at 75 cents each, say 248 yards of cloth at 75 cents a yard, deduct one-quarter of 248 from it, and call the remainder dollars. At a dollar a yard the result will be $248; then at 75 cents it must be $248—(¼ of 248)=$186.

Find the cost of 84 yards of cloth at $12\frac{1}{2}$ cents a yard.

What will 328 bags of potatoes cost at 75 cents a bag?

Find the cost of 20 gross of pen-handles at 25 cents each.

What will 216 pounds of raisins cost at 16⅔ cents a pound?

A railway charges a cent a mile, for the first 50 miles, for carrying a cord of wood, and then 3 cents for every 4 miles beyond the 50; what will it cost to carry 250 cords 90 miles?

If a clerk receives $640 a year, and his expenses are $325 a year, how many years will it take him to pay for a 56-acre farm at $45 an acre?

A fruit dealer bought 5 bushels of cherries at $2.50 a bushel, and sold them at 15 cents a quart; did he gain or lose, and how much?

6. Other Short Fractional Multiplication.

To multiply any number containing ½, such as 7½, 19½, 12½, etc., by itself, multiply the whole number by the next higher whole number, and annex ¼ to the product. Thus, $7\frac{1}{2} \times 7\frac{1}{2} = 7 \times 8 + \frac{1}{4} = 56\frac{1}{4}$; and $19\frac{1}{2} \times 19\frac{1}{2} = 19 \times 20 + \frac{1}{4} = 380\frac{1}{4}$. Apply this rule to the first column of exercises below.

To multiply two fractional numbers, such as 7¼ and 7¾, multiply 7 by 8, and add to the product the product of ¾ and ¼, or $\frac{3}{16}$, and you have the correct product. Apply this rule to the second column of exercises below.

To multiply two fractional numbers, each containing ½, such as 5½ by 7½, add the product of the whole numbers, plus ¼ to ½ of the sum of the whole numbers. Thus, $5 \times 7 = 35$; $35 + \frac{1}{2}(5+7) = 35+6 = 41$, and to this add ¼, making 41¼, the product. Apply this rule to the third column of exercises below.

To multiply two fractional numbers each containing ¾, such as 11¾ by 13¾; to the product of the whole numbers add the product of their sum by ¾, after which add the product of ¾ by ¾. This rule applies in all cases where both fractions are the same. Apply it in working the fourth column of exercises below.

EXAMPLES FOR PRACTICE.

$6\frac{1}{2} \times 6\frac{1}{2}$	$5\frac{1}{4} \times 5\frac{3}{4}$	$2\frac{1}{2} \times 5\frac{1}{2}$	$2\frac{3}{4} \times 4\frac{3}{4}$
$4\frac{1}{2} \times 4\frac{1}{2}$	$8\frac{1}{4} \times 8\frac{3}{4}$	$4\frac{1}{2} \times 6\frac{1}{2}$	$3\frac{1}{4} \times 3\frac{1}{4}$
$5\frac{1}{2} \times 5\frac{1}{2}$	$9\frac{1}{3} \times 9\frac{2}{3}$	$2\frac{1}{2} \times 8\frac{1}{2}$	$8\frac{3}{4} \times 2\frac{3}{4}$
$8\frac{1}{2} \times 8\frac{1}{2}$	$6\frac{1}{8} \times 6\frac{1}{8}$	$9\frac{1}{2} \times 8\frac{1}{2}$	$8\frac{3}{8} \times 4\frac{3}{8}$
$12\frac{1}{2} \times 12\frac{1}{2}$	$2\frac{3}{8} \times 2\frac{3}{8}$	$2\frac{1}{2} \times 7\frac{1}{2}$	$9\frac{1}{4} \times 4\frac{1}{4}$
$19\frac{1}{2} \times 19\frac{1}{2}$	$9\frac{1}{8} \times 9\frac{1}{8}$	$1\frac{1}{2} \times 9\frac{1}{2}$	$8\frac{1}{3} \times 2\frac{1}{3}$

7. To Multiply Numbers Ending in 5.

To multiply two small numbers each of which ends in 5, such as 35 and 75, take the product of the 3 and 7, increase this by one-half of the sum of these figures, and prefix the result to 25. Thus,

35 $\quad 5 \times 5 = 25$

75 $\quad 7 \times 3 = 21,\ 21 + \frac{1}{2}(7+3) = 26$

2625

This rule will be found to hold good with any two numbers each of which end with 5. Apply it to the examples below:

EXAMPLES FOR PRACTICE. 45×85; 95×25; 35×65; 75×95; 85×55.

8. To Multiply Special Large Numbers.

In the multiplication of large numbers, where one part of the multiplier is a *multiple* of the remainder, the work can always be considerably abbreviated. See the examples below:

2043

427 $= 420 + 7 = (7 \times 60) + 7$

14301 $= 2043 \times 7$

858060 $= 2043 \times 420 = 14301 \times 60$

872361 $=$ product.

3142

972 $= 900 + 72 = 900 + (9 \times 8)$

2827800 $= 3142 \times 900$

226224 $= 3142 \times 72 = 28278 \times 8$

3054024 $=$ product.

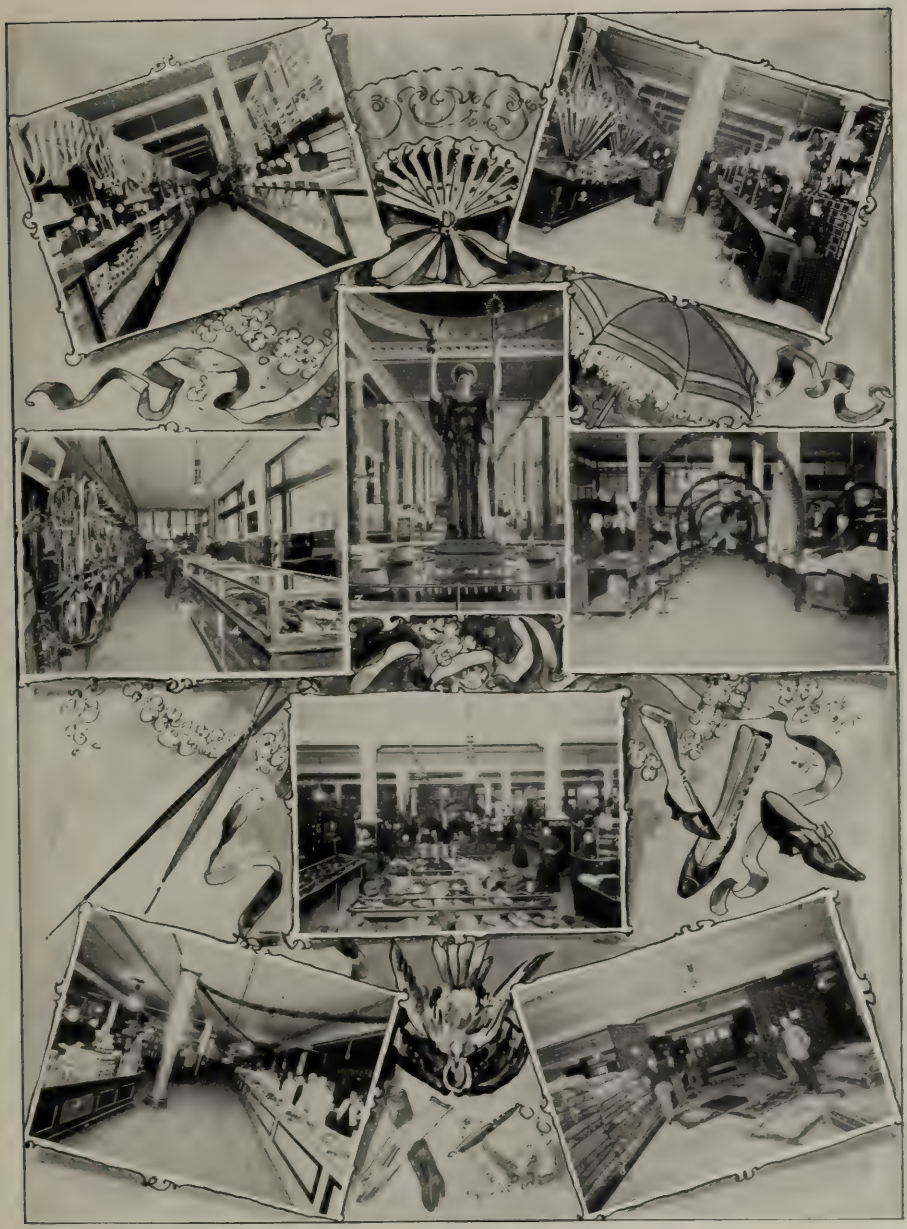
We first multiply by 7, then by 420, thus taking the number 2043, 427 times. The contraction is made in multiplying by 420. We take its factors, 7 and 60; we have already multiplied by 7, so that all that remains to be done is to multiply 14301 by 60 and place it under. The sum of the two partial products gives the whole product. As a test exercise, multiply some number by 14412 so as to have only two lines instead of five to add. See exercises in second and third columns below:

Remember, that any number is *divisible by 3* if the sum of its digits is divisible by 3; that any number is *divisible by 5* if its right-hand figure is 5 or 0; that any number is *divisible by 9* if the sum of its digits is divisible by 9.

EXERCISES. — 2013×927; 1214×279; 3135×728; 2146×287; 3210×189; 21401×729; 31252×14412; 42001×70357; 15421×81273; 30012×94572.

Lightning Table for Marking Goods Bought by the Dozen.

Retailers buy most of their articles by the *dozen*, such as boots, shoes, hats, caps, and notions



THE DEPARTMENT STORE

The Department Store is one of the earliest and greatest combinations of many business enterprises under one management. These stores, as their name implies, have many departments, each complete in itself as will be seen in this illustration —Boots and Shoes—Clothing—Hardware—House Furnishings—Art Works and other lines are represented. It certainly facilitates trade by convenience of arrangement.

of various kinds. A vast amount of time is employed in marking goods by the old process, and errors are frequent, owing to the unnecessary figures used. If the purchaser will commit to memory the following table, he can instantly find the retail price of a single article with any desired business per cent. added. The following per cents. are those generally used in business:

To make	Divide the cost per doz. by	
20 per cent.	10	
33⅓ "	9	
50 "	8	
100 "	6	
40 "	10, and add	1-6 itself.
35 "	10 "	1-8 "
37½ "	10 "	1-7 "
30 "	10 "	1-12 "
25 "	10 "	1-24 "
12½ "	10 and subtract	1-16 "
16⅔ "	10 "	1-36 "
18¾ "	10 "	1-96 "

S. T. Jones purchased one dozen hats for $27.00, and marked them to sell at a profit of 33⅓ per cent. What was the retail price of a single hat?

Explanation.—According to table, 9) $27.00
simply divide the cost per dozen by 9.

Ans. $3.00

For how much must I sell books bought at $28.00 per dozen, to gain 25 per cent?

Explanation.—Removing the point 24) 2.800
one place to the left, on $28.00 we get .11
$2.800. Now add 1-24 itself and we
have $2.91 = ans. $2.91+

The above table should be committed to memory.

Board Bills, Day or Week.

The following tables will also answer for calculating the amount of wages by the week or month of hired girls, servants, etc., who are compelled to labor on the Sabbath; being calculated for seven days in the week instead of six.

Multiply these tables by 4, and you have wages by the month:

At $2.00 a wk. Dys.	$ Cts.	At $2.25 a wk. Dys.	$ Cts.	At $2.50 a wk. Dys.	$ Cts.	At $3.00 a wk. Dys.	$ Cts.
1	28½	1	32	1	35¾	1	43
2	57	2	64¼	2	71½	2	85¾
3	85¾	3	96¼	3	1 07¼	3	1 28¾
4	1 14¼	4	1 28½	4	1 43	4	1 71½
5	1 42¾	5	1 60½	5	1 78¾	5	2 14¼
6	1 71¼	6	1 92¾	6	2 14¼	6	2 57
7	2 00	7	2 25	7	2 50	7	3 00

NOTE.—To find the daily rate at $4 per week, double the $2 rate; at $4.50, double the $2.25 rate, etc., etc. This table thus suffices for all the usual rates of board from $2 to $15 per week.

Wages per Hour Under a Daily Contract.

At 50 cts. a day. Showing the rate of wages per hour, for 12 hours a day. Hrs.	$ Cts.	At 75 cts. a day. Showing the rate of wages per hour, for 12 hours a day. Hrs.	$ Cts.	At $1.25 a day. Showing the rate of wages per hour, for 12 hours a day. Hrs.	$ Cts.	At $1.75 a day. Showing the rate of wages per hour, for 12 hours a day. Hrs.	$ Cts.
1	4¼	1	6¼	1	10½	1	14½
2	8½	2	12½	2	21	2	29
3	12½	3	18¾	3	31¼	3	43¾
4	16¾	4	25	4	41¾	4	58¼
5	21	5	31¼	5	52¼	5	72¾
6	25	6	37½	6	62½	6	87½
7	29½	7	43¾	7	73	7	1 02
8	33½	8	50	8	83½	8	1 16½
9	37½	9	56¼	9	93¾	9	1 31¼
10	41¾	10	62½	10	1 04¼	10	1 45¾
11	46	11	68¾	11	1 14¾	11	1 60¼
12	50	12	75	12	1 25	12	1 75

NOTE.—To find hourly rate at $1 per day, double the 50c. rate; at $1.50 per day, double the 75c. rate; at $2 per day, multiply 50c. rate by 4; at $2.50 per day, double the $1.25 rate; at $3 per day, multiply 75c. rate by 4; at $3.50 per day, double the $1.75 rate, etc.

Daily Rate of Wages Under a Weekly Contract.

At 62½ cts per day, or $3.75 per week. Dys.	$ Cts.	At $1.00 per day, or $6.00 per week. Dys.	$ Cts.	At $1.25 per day, or $7 50 per week. Dys.	$ Cts.	At $1.50 per day, or $9.00 per week. Dys.	$ Cts.
¼	15½	¼	25	¼	31¼	¼	37½
½	31¼	½	50	½	62½	½	75
¾	47	¾	75	¾	93¾	¾	1 12½
1	62½	1	1 00	1	1 25	1	1 50
1¼	78	1¼	1 25	1¼	1 56¼	1¼	1 87½
1½	93¾	1½	1 50	1½	1 87½	1½	2 25
1¾	1 09¾	1¾	1 75	1¾	2 18¾	1¾	2 62½
2	1 25	2	2 00	2	2 50	2	3 00
2¼	1 40½	2¼	2 25	2¼	2 81¼	2¼	3 37½
2½	1 56¼	2½	2 50	2½	3 12½	2½	3 75
2¾	1 72	2¾	2 75	2¾	3 43¾	2⅔	4 12½
3	1 87½	3	3 00	3	3 75	3	4 50
3¼	2 03¾	3¼	3 25	3¼	4 06¼	3¼	4 87½
3½	2 18¾	3½	3 50	3½	4 37½	3½	5 25
3¾	2 34½	3¾	3 75	3¾	4 68¾	3¾	5 62½
4	2 50	4	4 00	4	5 00	4	6 00
4¼	2 65¾	4¼	4 25	4¼	5 31¼	4¼	6 37½
4½	2 81¼	4½	4 50	4½	5 62½	4½	6 75
4¾	2 97	4¾	4 75	4¾	5 93¾	4¾	7 12½
5	3 12½	5	5 00	5	6 25	5	7 50
5¼	3 28¼	5¼	5 25	5¼	6 56¼	5¼	7 87½
5½	3 43¾	5½	5 50	5½	6 87½	5½	8 25
5¾	3 59½	5¾	5 75	5¾	7 18¾	5¾	8 62½
6	3 75	6	6 00	6	7 50	6	9 00

Rapid Method for Counting Interest.

The method of reckoning interest generally used by the best accountants and bookkeepers is what is known as the sixty-day method. By this method 360 days are reconed as a year and 30 days as a month. Six

per cent. for 12 months, or 1 year, is equivalent to 1 per cent. for 2 months, or 60 days, and 1 per cent. of any number is easily found by moving the decimal point two places to the left. Therefore, the interest on any amount at 6 per cent. per annum for 2 months, or 60 days, may be found by moving the decimal point two places to the left. Having found the interest for 60 days, in order to find it from that amount for any number of days, simply divide them into aliquot parts of 60.

EXAMPLE 1: Interest on $128 for 90 days.

1.28 = interest for 60 days.
.64 = interest for 30 days.

1.92 = interest for 90 days. 60+30.

EXAMPLE 2: Interest on $185.40 for 47 days.

1.8540 = interest for 60 days.

.9270 = interest for 30 days, ½ of 60.
.4635 = interest for 15 days, ½ of 30.
.0618 = interest for 2 days, 1/15 of 30.

1.4523 = interest for 47 days. 30+15+2.

Interest Table.

The interest on any sum of money may readily be found by means of the following table showing the interest on $1 at various rates and times:

Yr.	5%	6%	7%	8%	Yr.	5%	6%	7%	8%
1	.05	.06	.07	.08	4	.20	.24	.28	.32
2	.10	.12	.14	.16	5	.25	.30	.35	.40
3	.15	.18	.21	.24	6	.30	.36	.42	.48
Mo.					Mo.				
1	.00416	.005	.00583	.00666	7	.02916	.035	.04083	.04666
2	.00833	.01	.01166	.01333	8	.03333	.04	.04666	.05333
3	.01250	.015	.01750	.02000	9	.03750	.045	.05250	.06000
4	.01666	.02	.02333	.02666	10	.04166	.05	.05833	.06666
5	.02083	.025	.02916	.03333	11	.04583	.055	.06416	.07333
6	.02500	.03	.03500	.04000					
Da.					Da.				
1	.00013	.00016	.00019	.00022	16	.00222	.00266	.00311	.00355
2	.00027	.00033	.00038	.00044	17	.00236	.00283	.00330	.00377
3	.00041	.00050	.00058	.00066	18	.00250	.00300	.00350	.00400
4	.00055	.00066	.00077	.00088	19	.00263	.00316	.00369	.00422
5	.00069	.00083	.00097	.00111	20	.00277	.00333	.00388	.00444
6	.00083	.00100	.00116	.00133	21	.00291	.00350	.00408	.00466
7	.00097	.00116	.00136	.00155	22	.00305	.00366	.00427	.00488
8	.00111	.00133	.00155	.00177	23	.00319	.00383	.00447	.00511
9	.00125	.00150	.00175	.00200	24	.00333	.00400	.00466	.00533
10	.00138	.00166	.00194	.00222	25	.00347	.00416	.00486	.00555
11	.00152	.00183	.00213	.00244	26	.00361	.00433	.00505	.00577
12	.00166	.00200	.00233	.00266	27	.00375	.00450	.00525	.00600
13	.00180	.00216	.00252	.00288	28	.00388	.00466	.00544	.00622
14	.00194	.00233	.00272	.00311	29	.00402	.00483	.00563	.00644
15	.00208	.00250	.00291	.00333					

Find interest for $1 in this table at given per cent. for given number of years, months and days and multiply by the given amount.

Table Showing How Many Days a Note Has to Run.

The following table will be found very useful to book-keepers in calculating the number of days a note has to run:

FROM	TO Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
January	365	31	59	90	120	151	181	212	243	273	304	334
February	334	365	28	59	89	120	150	181	212	242	273	306
March	306	337	365	31	61	92	122	153	184	214	245	275
April	275	306	334	365	30	61	91	122	153	183	214	244
May	245	276	304	335	365	31	61	92	123	153	184	214
June	214	245	273	304	334	365	30	61	92	122	153	183
July	184	215	243	274	304	335	365	31	62	93	123	153
August	153	184	212	243	273	304	334	365	31	61	92	122
September	122	153	181	212	242	272	303	334	365	30	61	91
October	92	123	151	182	212	243	273	304	335	365	31	61
November	61	92	120	151	181	212	242	273	304	334	365	30
December	31	62	90	121	151	182	212	243	274	304	335	365

The table gives the number of days intervening between any day in any month to a similar date in any other month. To ascertain these intervening days, run the eye along the line designated by title of the month on the left hand, until it reaches its intersection by the column headed at the top, by the month in which the note matures, and the figures at the angle denote the number of days from the first of the respective months. To this add the day upon which the note matures, and from the sum subtract the date of the month from which it is reckoned.

EXAMPLE.—A note falling due June 26th is offered for discount on March 10th; wanted, the number of days intervening before maturity.

The figures at the angle give . .	92
Add date of note's maturity . .	26
	118
Deduct date of discount . .	10
Days to run	108

EVERY-DAY LAW

ITS REQUIREMENTS AND PENALTIES—CRIMINAL LAW—LAWS GOVERNING BUSINESS TRANSACTIONS—THE MAKING OF NOTES—DRAWING LEASES, LANDLORDS AND TENANTS —CONTRACTS OF ALL KINDS—PARTNERSHIPS—CORPORATIONS—POWERS OF AGENTS AND ATTORNEYS—INSURANCE

IMPORTANT USAGES AND PRACTICES

Points of Criminal Law.

Law should be, and is intended to constitute, a rule of right governing the actions of man in his dealings with his fellow-beings.

You cannot lawfully condone an offense by receiving back stolen property.

The exemption of females from arrest applies only in civil, not in criminal matters.

Every man is bound to obey the call of a Sheriff for assistance in making an arrest.

The rule "Every man's house is his castle" does not hold good when a man is accused of crime.

Embezzlement can be charged only against a clerk or a servant, or the officer or agent of a corporation.

Bigamy cannot be proven in law if one party to a marriage has been absent and not heard from for five years.

Grand larceny is when the value of property stolen exceeds $25.00—when less than that, the offense is petit larceny.

Arson to be in the first degree must have been committed at night, and the buildings fired must have been inhabited.

Drunkenness is not a legal excuse for crime, but delirium tremens is considered by the law as a species of insanity.

In a case of assault it is only necessary to prove an "offer or attempt at assault." Battery presumes physical violence.

Mayhem, although popularly supposed to refer to injury to the face, lip, tongue, eye, or ear, applies to any injury done a limb.

A felony is a crime punishable by imprisonment in a State prison; an "infamous" crime is one punishable with death or State prison.

A police officer is not authorized to make an arrest without a warrant unless he has personal knowledge of the offense for which the arrest is made.

An accident is not a crime, unless criminal carelessness can be proven. A man shooting at a burglar and killing a member of his family is not a murderer.

Burglary in the first degree can be committed only in the night time. Twilight, if dark enough to prevent distinguishing a man's face, is the same as "night" in law.

Murder to be in the first degree must be wilful, premeditated, and malicious, or committed while the murderer is engaged in a felonious act. The killing of a man in a duel is murder, and it is a misdemeanor to accept or give a challenge.

False swearing is perjury in law only when willfully done, and when the oath has

been legally administered. Such qualifying expressions as "to the best of my belief," "as I am informed," may save an averment from being perjured. The law is that the false statement sworn to must be absolute. Subornation of perjury—that is, inducing another to swear falsely, is a felony.

The penalties which follow the violation of any of the points of criminal law vary slightly in various places, but all include fines or imprisonment, or both. The penalties are intended to be sufficiently severe to deter those evilly disposed from disturbing the peace and happiness of the community.

Important Points of Business Law.

The law compels no one to do impossibilities.

An agreement without consideration is not valid.

Ignorance of the law does not excuse an offender, but it does often influence the mercy of the Court in fixing penalty.

He who conceals a fraud is himself a defrauder.

Signatures made with a lead pencil are good in law.

A receipt for money paid is not legally conclusive.

The act of one partner binds all the others.

The seal of a party to a written contract imports consideration.

A contract made with a minor cannot be enforced against him. A note made by a minor is voidable.

A contract made with a lunatic is void.

A contract made on a Sunday is void.

Principals are liable for the acts of their agents.

Agents are liable to their principals for errors.

Each individual in a partnership is liable for the whole amount of the debts of the firm.

A note which does not state on its face that it bears interest, will bear interest only after maturity.

A lease of land for a longer term than one year is void unless in writing.

An indorser of a note is exempt from liability if notice of its dishonor is not mailed or served within twenty-four hours of its non-payment.

In case of the death of the principal maker of a note, the holder is not required to notify a surety that the note is not paid, before the settlement of the maker's estate.

Notes obtained by fraud, or made by an intoxicated person, are not collectible.

If no time of payment is specified in a note, it is payable on demand.

An indorser can avoid liability by writing "without recourse" beneath his signature.

A check indorsed by the payee is evidence of payment in the drawer's hands.

An outlawed debt is revived should the debtor make a partial payment.

Want of consideration—a common defense interposed to the payment of negotiable paper—is a good defense between the original parties to the paper; but after it has been transferred before maturity to an innocent holder for value it is not a defense.

Negotiable paper, payable to bearer or indorsed in blank, which has been stolen or lost, cannot be collected by the thief or finder, but a holder who receives it in good faith before maturity, for value, can hold it against the owner's claims at the time lost.

Sometimes the holder of a paper has the right to demand payment before maturity; for instance, when a draft has been protested for non-acceptance and the proper notices served, the holder may at once proceed against the drawer and indorsers.

If a note or draft is to be paid in the State where it is made, the contract will be governed by the laws of that State. When negotiable paper is payable in a State other than that in which it is made, the laws of that State will govern it. Marriage contracts, if valid where they are made, are valid everywhere. Contracts relating to personal property are governed by the laws of the place where made, except those relating to real estate, which are governed by the laws of the place where the land is situated.

If a negotiable paper, pledged to a bank as security for the payment of a loan or debt, falls due, and the bank fails to demand payment and to have it protested when dishonored, the bank is liable to the owner for the full amount of the paper.

The expression "Value received" should be written in a note, but it is not necessary. If not written, it is presumed by law, or may be supplied by proof.

No consideration is sufficient in law if it be illegal in its nature. Checks or drafts must be presented for payment without unreasonable delay. Checks or drafts should be presented during business hours; but in this country, except in the case of banks, the time extends through the day and evening.

If the drawer of a check or draft has changed his residence, the holder must use due or reasonable diligence to find him.

If one who holds a check, as payee or otherwise, transfers it to another, he has a right to insist that the check be presented that day, or, at farthest, on the day following.

A note indorsed in blank (the name of the indorser only written) is transferable by delivery, the same as if made payable to bearer.

The maker of an "accommodation" bill or note (one for which he has received no consideration, having lent his name or credit for the accommodation of the holder) is not bound to the person accommodated, but is bound to all other parties, precisely as if there was a good consideration.

An indorsee has a right of action against all whose names were on the bill, when he received it.

A bill, note or draft may be written upon any kind of paper, either with ink or pencil.

An indorsement may be written on the face or back.

An indorser may prevent his own liability to be sued by writing "without recourse," or similar words.

The holder of a note may give notice of protest either to all previous indorsers or only to one of them; in case of the latter he must select the last indorser, and the last must give notice to the last before him, and so on. Each indorser must send notice the same day or the day following. Neither Sunday nor any legal holiday is counted in reckoning time in which notice is to be given.

If the letter containing a protest of nonpayment be put into the post-office, any miscarriage does not affect the party giving notice. Notice of protest may be sent either to the place of business or of residence of the party notified.

After the death of a holder of a bill or note, his executor or administrator may transfer it by his indorsement.

The husband who acquires a right to a draft or note which was given to the wife, either before or after marriage, may indorse it.

Written instruments are to be construed and interpreted by law according to the simple, customary and natural meaning of the words used.

The finder of negotiable paper, as of all other property, must make reasonable efforts to find the owner, before he is entitled to appropriate it for his own purposes. If the finder conceal it, he is liable to the charge of larceny or theft.

Joint payees of a bill of exchange, draft or note, who are not partners, must all join in an indorsement.

An oral agreement must be proved by evidence. A written agreement proves itself. The law prefers written to oral evidence, because of its precision.

No evidence can be introduced to contradict or vary a written contract; but it may be received in order to explain it, when such explanation is needed.

Contracts and Agreements.

A contract or agreement is where a promise is made on one side and assented to on the other, or where two or more persons enter into engagement with each other by a promise on either side. In a written contract assent is proved by the signature or mark. In verbal agreements it may be given by a word or a nod, by shaking hands, or by a sign. The old adage, "Silence gives consent," is often upheld in law.

Persons under age are incompetent to make contracts except under certain limitations. Generally minors are incapable of making binding contracts.

There are several causes which void contracts, first among which is *fraud*. No fraudulent contract is binding in law or in equity; but the party defrauded must void the contract as soon as he discovers the

fraud. If he continues under the contract after the fraud is discovered he cannot afterwards void it.

Some Important Contract Don'ts.

DON'T enter into an agreement on Sunday unless it is ratified on a week-day.

DON'T make a contract with a person of unsound mind or under the influence of liquor, or otherwise under restraint of liberty, mind or body. Use caution in making contracts with an illiterate, blind or deaf and dumb person, and see to it that witnesses are present.

DON'T put a forced construction on a contract—the intent of the parties is a contract.

DON'T suppose that you can withdraw a proposition made in writing and sent by mail after the party to whom it was made has mailed an unconditional acceptance.

DON'T suppose that a conditional acceptance of a proposition is binding on the party making the proposition.

DON'T forget that the courts will construe a contract according to the law prevailing where it was made.

DON'T forget that the law says, "no consideration, no contract," and that the courts will not enforce a contract that is too severe in its provisions.

DON'T sign an agreement unless you have carefully weighed its provisions, which should be all fixed and certain.

Copartnerships.

Partnerships may be either general or special. In general partnerships money invested ceases to be individual property. Each member is made personally liable for the whole amount of debts incurred by the company. The company is liable for all contracts or obligations made by individual members.

Special partners are not liable beyond the amount contributed.

A person may become a partner by allowing people generally to presume that he is one, as, by having his name on the sign or parcel or in the bills used in the business.

A share or specific interest in the profits or loss of a business, as remuneration for labor may involve one in the liability of a partner.

In case of bankruptcy, the joint estate is first applied to the payment of partnership debts, the surplus only going to the creditors of the individual estate.

A dissolution of partnership may take place under express stipulations in the articles of agreement, by mutual consent, by the death or insanity of one of the firm, by award of arbitrators, or by court of equity in cases of misconduct of some member of the firm.

Interest Laws and Statutes of Limitations.

States and Territories.	Interest Rate.		Statutes of Limitations.		
	Legal Rate.	Rate Allowed by Contract.	Judgments, Years.	Notes, Years.	Open Accounts, Years.
	per ct.	per ct.			
Alabama	8	8	20	6	3
Arkansas	6	10	10	5	3
Arizona	7	Any rate.	5	5	3
California	7	Any rate.	5	4	2
Colorado	8	Any rate.	10	6	6
Connecticut	6	†	...	6	6
Delaware	6	6	20	6	3
District of Columbia	6	10	12	3	3
Florida	8	10	20	5	2
Georgia	7	8	7	6	4
Idaho	7	12	6	(†)	4
Illinois	(†)	7	20	10	5
Indiana	6	8	20	10	6
Iowa	6	8	20	10	5
Kansas	6	10	5	5	3
Kentucky	6	6	15	15	5
Louisiana	5	8	10	5	3
Maine	6	Any rate.	20	6	6
Maryland	6	6	12	3	3
Massachusetts	6	Any rate.	20	6	6
Michigan	5	7	6	6	6
Minnesota	6	10	10	6	6
Mississippi	6	10	7	6	3
Missouri	6	8	10	10	5
Montana	10	Any rate.	10	8	3
Nebraska	7	10	5	5	4
Nevada	7	Any rate.	6	5	4
New Hampshire	6	6	20	6	6
New Jersey	6	6	20	6	6
New Mexico	6	12	7	6	6
New York	6	6	20	6	4
North Carolina	6	6	10	3	3
North Dakota	7	12	10	6	6
Ohio	6	8	5	15	6
Oklahoma	7	12	5	5	3
Oregon	6	10	10	6	6
Pennsylvania	6	6	5	6	6
Rhode Island	6	Any rate.	20	6	6
South Carolina	7	8	10	6	6
South Dakota	7	12	10	6	6
Tennessee	6	Any rate.	10	6	6
Texas	6	10	10	6	4
Utah	8	Any rate.	8	6	4
Vermont	6	6	8	6	6
Virginia	6	6	20	5	2
Washington	7	12	6	6	3
West Virginia	6	6	10	10	3
Wisconsin	6	10	20	6	6
Wyoming	8	12	5	5	8

New York has by a recent law legalized any rate of interest on call loans of $500 or upward, on collateral security. †No usury, but over 6 per cent. cannot be collected by law.

A partner signing his individual name to negotiable paper, which is for the use of the partnership firm, binds all the partners thereby. Negotiable paper of the firm, even

though given on private account by one of the partners, will hold all the partners of the firm, when it passes into the hands of the holders, who are ignorant of the fact attending its creation.

Partnership effects may be bought and sold by a partner; he may make contracts; may receive money; indorse, draw and accept bills and notes, and, while this may be for his own private account, if it apparently be for the use of the firm, his partners will be bound by his action, provided the parties dealing with him were ignorant of the transaction being on his private account; and thus representation or misrepresentation of a partner, having relation to business of the firm, will bind the members in the partnership.

In case of death, the surviving partner must account to the representatives of the deceased.

Agents and Attorneys.

An agent or an attorney is one authorized by a person to act for him and in his stead, in the transaction of business for the person appointing said agent or attorney.

In regard to the subject of an agency, the general rule is, that whatever a man may do in his own right he may also transact through another. Things of a personal nature, implying personal confidence on the part of the person possessing them, cannot be delegated.

Infants, married women, lunatics, idiots, aliens, belligerents, and persons incapable of making legal contracts, cannot act as principals in the appointment of agents. Infants and married women may, however, become principals in certain cases.

The act of the agent always binds his principal. Agents who exceed their authority, become themselves personally responsible to their principals.

One should not consent to act as an agent or attorney in complicated matters, except where the powers of this office be explicitly defined in writing.

Agency may be terminated in two ways: (1) by the act of the principal or agent; (2) by operation of law. In the latter case, the termination of the agency is effected by lapse of time, by completion of the subject-matter of the agency, by the extinction of the subject-matter, or by the insanity, bankruptcy or death of either party.

Landlord and Tenant.

Leases for one year or less need no written agreement. Leases for more than a year must be in writing; if for life, signed, sealed, and witnessed in the same manner as any other important document.

Leases for over three years must be recorded. No particular form is necessary.

If no agreement in writing for more than a year can be produced, the tenant holds the property from year to year at the will of the landlord. If there is no agreement as to time, the tenant as a rule holds from year to year.

A tenancy at will may be terminated by giving the tenant one month's notice in writing, requiring him to remove from the premises occupied.

A tenant is not responsible for taxes, unless it be so stated in the lease.

The tenant may underlet as much of the property as he desires, unless it is expressly forbidden in the lease. Tenants at will cannot underlet.

A married woman cannot lease her property under the common law, but this prohibition is removed by statute in most of the States. A husband cannot make a lease which will bind his wife's property after his death.

A lease made by a minor is not binding after the minor has attained his majority. It binds the lessee, however, unless the minor should release him. Should the minor receive rent after attaining his majority, the lease will be therefore ratified. A lease given by a guardian will not extend beyond the majority of the ward.

A new lease renders void a former lease.

In case there are no writings, the tenancy begins from the day possession is taken; where there are writings and the time of commencement is not stated, the tenancy will be held to commence from the date of said writings.

Leases on mortgaged property, whereon the mortgage was given prior to the lease, terminate when the mortgage is foreclosed.

Where a tenant assigns his lease, even with the landlord's consent, he will remain liable for the rent unless his lease is surrendered or cancelled.

A building erected by tenants on foundations sunk into the ground, becomes a part of the realty, and belong to the landlord. Improvements to the building rented, that are nailed or screwed to the building become the property of the landlord. But trade fixtures belong to the tenant, it being presumed when the building is rented for trade purposes that it is permissible to put in the fixtures or make necessary attachments of same to the building. Among our business forms will be found a correct form of lease. Care must be taken in filling necessary blanks, and in ruling lines in spaces not filled by words.

Laws Governing Liens.

In all the States and Canada it is the object of the law to protect the mechanic and laboring man and also the merchant. Hence there are laws in the several States for this purpose. While the general trend is the same, the laws vary in details. It is not difficult to procure a copy of the laws, which every builder and householder should do. Any contractor, sub-contractor or laborer who performs any work, or furnishes any materials, in pursuance of, or in conformity with, any agreement or contract with the owner, lessee, agent or one in possession of the property, toward the erection, altering, improving or repairing of any building, shall have a lien for the value of such labor or materials on the building or land on which it stands to the extent of the right, title and interest of the owner, lessee or person in possession at the time of the claimant's filing his notice with the Clerk of the County Court. Such lien is called a mechanic's lien.

The notice should be filed within thirty days after completion of the work or the furnishing of the materials, and should state the residence of the claimant, the amount claimed, from whom due, when due, and to whom due, the name of the person against whom claimed, the name of the owner, lessee or person in possession of the premises, with a brief description of the latter.

Liens cease in one year after the filing of the notice, unless an action is begun, or the lien is continued by an order of Court.

The following classes of persons are generally entitled to lien: 1. Bailees, who may perform labor and services, on the thing bailed, at the request of the bailor. 2. Innkeepers, upon the baggage of guests they have accommodated. 3. Common carriers, upon goods carried, for the amount of their freight and disbursements. 4. Vendors, on the goods sold for payment of the price where no credit has been expressly promised or implied. 5. Agents, upon goods of their principals, for advancements for the benefit of the latter. 6. All persons are entitled to the right of lien who are compelled by law to receive property and bestow labor or expense on the same.

The right of lien may be waived: 1. By express contract. 2. By neglect. 3. By new agreement. 4. By allowing change of possession. 5. By surrendering possession.

The manner of the enforcement of a lien, whether it be an innkeeper's, agent's, carrier's, factor's, etc., depends wholly upon the nature and character of the lien.

Perishable property on which a lien is held may be sold, and the lien attaches to the proceeds.

Liens take precedence according to priority, and interest on a judgment on a prior lien must also be satisfied before a subsequent lien may be realized upon.

What a Copyright Protects.

A title may be entered, but the copyright covers the book and not the title. A title alone cannot be copyrighted; it can be protected solely as a trade mark. What is a copyrighted manuscript? Copyright pertains to a published book only. So long as a book is in manuscript it is protected by a common law of property; no one can print it without authority unless he steals it. It is when a book is published that the copyright law steps in to protect it. Every day we have evidence that authors have wrong notions of copyright; they make a point of having obtained copyright as if it were something difficult—like a patent—and think they have in some way secured their book and their title by entering the latter.

THE EIFFEL TOWER—A MARVEL OF ENGINEERING

Erected for the Paris Exposition of 1889, the tower was also an attraction at the Exposition of 1900. It is built of metallic piers in viaducts, and is 984 feet high. The iron used in its construction weighs 7300 tons.

BOOK II.

SCIENCE

WHAT EVERYONE SHOULD KNOW IN THE WORLD OF SCIENCE AS APPLIED TO WOOD AND METAL, AIR, LIGHT, WATER AND HEAT, ELECTRICITY AND ITS MARVELOUS USES—THE PREDICTION OF THE WEATHER AND OTHER PRACTICAL APPLICATIONS OF SCIENCE IN ALL TRADES, PROFESSIONS AND INDUSTRIES.

SCIENCE AS APPLIED IN PRACTICE

By

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THE WORLD OF SCIENCE

WHAT INTERESTS THE WORKER IN WOOD—IN METALS AND MINERALS—ELECTRICITY AND ITS WONDERFUL POSSIBILITIES—HEAT, ITS LAWS AND MANIFESTATIONS—STEAM AND ITS APPLICATION—OTHER SCIENCES OF EVERY-DAY INTEREST AND APPLICATION

SCIENCE AS APPLIED IN PRACTICE

Science is a word which by many is not very well understood, and of which a brief definition may be here advisable. It is often wrongly applied, and its use is in general very loose. Science means knowledge; but this knowledge is of the works of God; not of those of man; of the forms and forces among which we are born, not of those which our own hands have made. The latter is the domain of useful art, not of science. The study of the nature of electricity is science; the use of the electric current in telegraphing is art. The study of the formation of coal or iron is science; the employment of coal and iron in manufacture is art. And so with a thousand other cases that might be given.

In our times it is not easy to talk about science without thinking of the many uses which man makes of scientific facts and principles. When we speak of light or electricity for instance, we are very apt to think of the telescope or the mirror, the telegraph or the electric light. It is these applications of science in which practical men are most interested, and as this is a book for the use of practical men we propose to confine ourselves largely to the benefit which the facts of science confer upon man. In the present chapter we shall talk about the production and working of wood and metal and some other products of the earth.

Forests of the Earth.

Ages before the vast coal deposits came into use as sources of fuel, wood served man for the purposes of heating and cooking, and its use was very general until within the nineteenth century. It is still widely used for household purposes, though in modern cities coal has largely taken its place, and wood is now rarely employed as a fuel in manufactories.

Though civilization has been lavish in its destruction of forests, the breadth of the woodland still remaining upon the earth is enormous. In the Eastern Hemisphere Russia possesses a vast extent of forest land, stretching widely through European Russia and over an immense region in Siberia. Africa contains mighty forests, one of which it took Stanley several months to cross. But of all the earth America is the richest in timber. Through North and South America alike vast forests extend. In South America the immense valley of the Amazon, one third of the whole continent, is one mighty unbroken forest. In North America also the forests are of vast extent, though the axe and the firebrand are rapidly robbing the United States of its trees.

United States Lumber Product.

The total area of forest lands in the United States and Territories, according to annual

report of the Division of Forestry of the Department of Agriculture, is 465,795,000 acres. The State which has the largest share is Texas, which is credited with 40,000,000 acres. Minnesota comes next with 30,000,000, then Arkansas with 28,000,000; and Florida, Oregon, California and Washington State are put down at 20,000,000 each. Georgia and North Carolina have each 18,000,000; Wisconsin and Alabama, each 17,000,000; Tennessee, 16,000,000; Michigan, 14,000.000; and Maine, 2,000,000 acres. Taking the States in groups, the six New England States have, in round numbers, 19,000,000 acres; four Middle States, 18,000,000; nine Western States, 80,000.000; four Pacific States, 53,000,000; and fourteen Southern States, 233,000,000 acres; the last being almost precisely half of the forest area of the country. The Territories are credited with 63,000,000 acres. The estimate of the division of Forestry for 1900 makes the forest area 699,500,000 acres.

The total annual cut in this vast area of forest approximates 24,000,000,000 cubic feet, of which about three-fourths, or 18,000,000,000 feet are used for fuel, 5,000,000,000 feet for building and manufacturing lumber and the remaining 1,000,000,000 feet for fencing, railroad ties, mine timbers, charcoal, and other purposes.

This immense drain upon the forests of the United States is not the whole. Every year fires make great inroads into the woodland area, in many regions more timber falling by fire than by the axe. The average annual money loss by fire is probably as much as $20,000,000. The value of the total annual product of our forests was estimated by the 1890 Census at $1,038,616,947. It is now probably much greater.

Forest Preservation.

The destruction of the forests is very injurious to human interests, since it has a serious effect on the fall and flow of rainwater. The forest bed holds the water and yields it slowly to the streams. In a deforested country the water pours down and swells the streams to torrents in the rainy season, while they shrink into narrow channels in times of drought. Forests are thus great regulators of the water supply. This has long been perceived in Europe, where active efforts have long been made to restore the trees to the mountains and hill slopes. It has only recently been perceived in the United States, where efforts at forest preservation are of late origin. What has been accomplished may be briefly stated.

For the preservation of the forests, the State of New York first instituted a Forest Commission in 1885. Several radical changes have been made in the law, which now provides for a "Commission of Fisheries, Game, and Forests," to which is delegated the enforcement of the fish and game laws, the care of the Adirondack Park, and the State Forest Preserve. The Legislature of 1897 authorized the purchase of lands in the Adirondacks as an addition to the Park and Forest Reserve to the amount of $1,000,000, to which $500,000 in 1898 and $300,000 in 1899 have since been added. A State College of Forestry has been opened at Cornell University, and has charge of 30,000 acres of State land as a demonstration forest in the Adirondacks. Better methods of handling spruce lands have been introduced on 100,000 acres of private forests, under the direction of the Division of Forestry, U. S. Department of Agriculture. The States of Kansas, Michigan, Minnesota, Maine, New Hampshire, Pennsylvania, and Wisconsin also have special commissions under their forestry laws. The Pennsylvania Legislature of 1897 provided for the purchase of three forest reserves of not less than 40,000 acres each, and the Wisconsin Assembly appointed a commission to formulate and recommend forest legislation. Minnesota has probably the best forest fire law of any State, with a Chief Fire Warden as executive officer. In New Jersey and North Carolina the Geological Survey is specially charged with forest interests.

A national organization known as the American Forestry Association, composed of delegates from the States, meets annually. Local or State Associations have been formed in California, Connecticut, Colorado, Ohio, New York, Pennsylvania, Kentucky, Massachusetts, Indiana, North Carolina, South Carolina, Washington, Minnesota, Texas, Utah, North Dakota, Wisconsin and New Jersey.

By Act of Congress March 3, 1891, the President was authorized to make public forest reservations. Seventeen such, comprising 17,968,440 acres, were established in Colorado, New Mexico, California, Arizona, Wyoming, Oregon, and Washington, previous to 1897. On February 22, 1897, President Cleveland proclaimed thirteen additional reserves, with a total area of 25,683,840 acres.

Since then, under an Act of Congress of March 1, 1898, extensive additional areas have been reserved in Arizona, New Mexico, South Dakota, Montana, Utah, Wyoming, and California, and the grand total of the forest reservations reached on January 1, 1901, the great area of 46,828,449 acres, there being at that date thirty-nine reservations. In addition, many States now offer a reward for the planting of trees. This is especially the case in some of the prairie States of the West, as Kansas, Nebraska, and Iowa, and vast numbers of trees have been planted. Arbor Days have also been established in nearly all the States of the Union, forming public holidays for tree-planting, school children being especially encouraged in this important duty. As may be seen from the above, the new age of forest preservation has fairly begun in the United States.

Useful Trees.

The earth possesses a very great number of different woods which man can utilize. In the United States there are more than 300 species of trees of a height of thirty feet and over. South America has a much greater number, and India alone possesses about 900 species of timber trees. But many of these are rare, and comparatively few species are used in the arts.

Chief among the American timber trees stands the White Pine (*Pinus strobus*), an easily worked and very useful wood. This was formerly very abundant, but has been cut so lavishly, without replanting, that the forests of the East are largely exhausted, and the vast pineries of Michigan and Wisconsin are rapidly vanishing before the axe and the sawmill. Other trees of importance are the Yellow Pine, the Hemlock, the Black Spruce, the Cedar, Cypress, and Cottonwood of the East and South, the Great Douglas Pine and Redwood of the Pacific States, one or two species of Oak, and various others. Among the varieties of hardwood timber used for furniture, the Black Walnut has long stood at the head, but this has largely disappeared, and several species of light-colored wood, such as Oak, Maple, and others, are taking its place.

Ornamental Woods.

Outside the United States, and especially in the tropics, there are numerous species of valuable ornamental woods. Most important of these is the Mahogany of the American tropics, a close-grained, easily worked hardwood, of rich dark color, taking a fine polish, and very durable. Brazilian Rosewood is a strong, hard, and heavy wood, of a rich dark-brown color, with beautiful streaks and cloud-like markings, which give it a resemblance to colored marble. It has long been in use for costly furniture. Satinwood is something like it in hardness and fineness of grain, but is of much lighter color, being of a glossy yellow tint. Ebony, another costly cabinet wood, is very hard and heavy, and deep black in color. Inlaid with ivory or other light substance, it has been a favorite for several thousand years for ornamental purposes.

Among the very beautiful woods used only for veneering and inlaying are the Tulip-wood, Snake or Letter-wood, Purple-heart, and Zebra-wood, from the American tropics; Amboyna-wood, from Singapore; the American Bird's-eye Maple, and others. Of all woods Lignum Vitæ comes nearest to a strong metal in its resistance to wear and tear.

For ship-building oak has long been a favorite wood, and is still largely used, though it has the defect of rusting iron which is in contact with it. The East Indian teak comes next to it in value, and is unlike oak in its action upon iron, which it protects from rust. This gives it great value as a backing for iron-plating. Elm is also of value for the under-water parts of ships, it being very durable both when kept quite dry and when constantly wet.

Useful Trees of the Philippine Islands.

The Philippine Islands, now possessions of the United States, are exceedingly rich in valuable timber trees, more than 200 kinds having been officially tested in the Manila arsenal. Among these are no less than fifty varieties of hardwood lumber, of which only a few have been used outside the islands. Chief among these is the teak-like Molave, a heavy brown timber, almost as hard as steel, and of great strength. It resists the action of water for years, is proof against the destructive white ant, and is used for all purposes. Its firm surface admits of fine carving. Two other trees, the Ipil and the Yacul, resist the white ant (a very valuable property in the tropics), and there are various handsome woods suitable for fine furniture. The Bansalque, or bullet-tree, yields a wood of such iron-like hardness that it can be driven like a nail. These woods vary in color from the jet-black Ebony to the light-hued Cedar, two of very ornamental color being the Mabola (black streaked with yellow) and the Malatapay (black striped with red). Cuba, our near neighbor, has also many fine cabinet woods, more than forty in all, including Mahogany, Ebony, Lignum Vitæ, and others; also Logwood, Ironwood, and many species of palms.

The Lumbering Industry.

Everywhere the method of the lumberman is to saw the timber into logs where it is felled, and haul it or float it to the sawmill, where it is cut into boards, scantling, shingles, and other merchantable forms. In Maine and Nova Scotia the logs are floated down the streams in drives, and sometimes made into great rafts and towed down the coast. The logs in winter are loaded on great sledges and hauled to the streams. But the extension of railroads has greatly changed those primitive methods, and much of the timber is now transported on cars.

In the lake region of the West the sawmill follows the receding forest, cutting the timber into merchantable sizes as it goes. The felled tree is sawed into lengths of 32 feet if small, and 16 feet if large, and hauled to the mill, or to the streams or railroads, by the use of "big wheels," of 10 to 12 feet diameter. In many sections it is the custom to lay a double row of smooth logs and grease their upper surfaces. Along this slippery track logs are easily hauled by horses, with little danger of leaving the path.

Seasoning Timber.

Timber, when freshly cut, contains from thirty-seven to forty-eight per cent. of water, the kind, the age, and the season of vegetation governing the percentage. Older wood is generally heavier than young wood, and the weight of wood cut in the active season is greater than that of wood cut in the dormant season. Water in wood is not chemically combined with the fiber, and, when exposed to the atmosphere, the moisture evaporates. The wood becomes lighter until a certain point is reached in the drying out process, after which it gains or loses in the weight according to the variations in the moisture and temperature of the atmosphere. Following is a table showing the percentage in weight of water in round woods from young trees at different lengths of time after cutting:

Kind of Wood.	6 mos.	12 mos.	18 mos.	24 mos.
Beech	30.44	23.46	18.60	19.95
Oak	32.71	26.74	23.25	20.28
Hornbeam . . .	27.19	23.08	20.00	18.59
Birch	39.72	29.01	22.73	19.52
Poplar	40.45	26.22	17.77	17.92
Fir	41.78	16.87	15.21	18.00
Pine	41.70	18.67	15.63	17.42

According to these figures, taken from actual trials, there is nothing gained by keeping wood longer than eighteen months, so far as drying or seasoning is concerned. In the woods mentioned, there appears to be an actual loss in some, and only a slow gain in others after that length of time. The pine, fir, and beech gained moisture, and the others in the list lost only very slightly after the eighteen months had passed.

Trees, especially deciduous trees, should always be felled in winter, the season in which they contain the least sap. They should not be left long upon the ground where they have fallen, but as soon as possible the logs should be stacked, with packing pieces between them, so as to allow the sap to evaporate during which time they

need to be covered from the weather. When cut into planks or boards these are laid horizontally, separated by laths, protected from rain, and left to dry for six months. They should then be placed upright upon racks, slightly separated and left for as long a time. For natural seasoning most ordinary timber need this length of time, though some dry more quickly than others. This is much the best method of seasoning, but the work is now often hastened by steaming or boiling, or in the case of thin cut wood by placing it in hot-air chambers. Very frequently the process of seasoning is only partly completed and the wood sent to market unfit for use. In the case of cabinet and fine joining work the seasoned wood is commonly, just before using, put for a week or ten days into a stove heated to about 120° F.

The Annual Rings in Trees.

The annual rings in trees exist as such in all timber grown in the temperate zone. Their structure is so different in different groups of timber that, from their appearance alone, the quality of the timber may be judged to some extent. For this purpose the absolute width of the rings, the regularity in width from year to year, and the proportion of spring wood to autumn wood must be taken into account. Spring wood is characterized by less substantial elements, the vessels of thin-walled cells being in greater abundance, while autumn wood is formed of cells with thicker walls, which appear darker in color. In conifers and deciduous trees the annual rings are very distinct, while in trees like the birch, linden and maple the distinction is not so marked, because the vessels are more evenly distributed. Sometimes the gradual change in appearance of the annual ring from spring to autumn wood, which is due to the difference in its component elements, is interrupted in such a manner that a more or less pronounced layer of autumn wood can apparently be recognized, which again gradually changes to spring or summer wood, and then gradually finishes with the regular autumn wood. This irregularity may occur even more than once in the same ring, and this has led to the notion that the annual rings are not a true indication of age; but the double or counterfeit rings can be distinguished by a practiced eye with the aid of a magnifying glass. These irregularities are due to some interruption of the functions of the tree, caused by defoliation, extreme climatic condition or sudden changes of temperature. The breadth of the rings depends on the length of the period of vegetation; also when the soil is deep and rich, and light has much influence on the tree, the rings will be broader. The amount of light, and the consequent development of foliage, is perhaps the most powerful factor in wood formation, and it is upon the proper use of this that the forester depends for his means of regulating the development and quantity of his crop.

The Many Uses of Wood.

Wood shares with iron the honor of being one of the most useful products which nature has provided for man. In early times it was the one great servant of the human race. Before coal was known it was the only fuel, and before iron was known it served man for almost every purpose of life. Taking the whole world, it is still the chief fuel, and even in the United States, where coal is so plentiful, and wood has so many other uses, three-fourths the annual product is consumed in the stove.

For ages wood has been the great building material, the mainstay of the carpenter and the architect. Man has lived in wooden houses, crossed the streams on bridges of wood, inclosed his fields with wooden fences, put to sea in wooden ships, built his carriages and cars of wood, used wood for the furniture of his dwellings, the handles of his tools, the framework of his machines, and for various other purposes, among which we must include the finest cabinet and ornamental work. The great growth of the railroad system has developed a new use for wood in the building of passenger and freight cars and the innumerable ties to which the rails are fastened, while the telegraph pole has become another great consumer of the forest product.

Of late years iron has come into close competition with wood. The growing scarcity of wood, the increasing cheapness of

iron, are leading causes of this, and we are now in the age of iron buildings, iron bridges, iron ships, and wire fencing, while even railroad cars are being made of sheet steel. Efforts have been made to find a substitute for wood in railroad ties, even glass being suggested, but as yet without satisfactory result.

But while wood has been removed from many of its old duties, new ones have arisen which are consuming it with great rapidity. One of these is the wood pavement, which, however, has made no great progress. The common lead-pencil seems a thing of small importance, yet it has made serious havoc in our cedar groves. The best wood in the world for this purpose is a soft, close-grained cedar which grows along the coast of Florida, and which is used in great quantities both in America and Europe for inclosing the black lead of the pencil. Another small article which consumes no small quantity of the forest product is the common friction match. In this little household treasure many tons of wood are daily burned to ashes. There is a single English factory which makes thirty-six billions of matches yearly, and at the Chicago Fair of 1893 there were shown German match machines that would cut fifteen million splints a day. Europe consumes about 1200 tons of phosphorus in matches every year, and it is said that in some nations 700 matches are used yearly for every inhabitant. Of all nations, the United States is the greatest consumer of matches.

The Manufacture of Wood Paper.

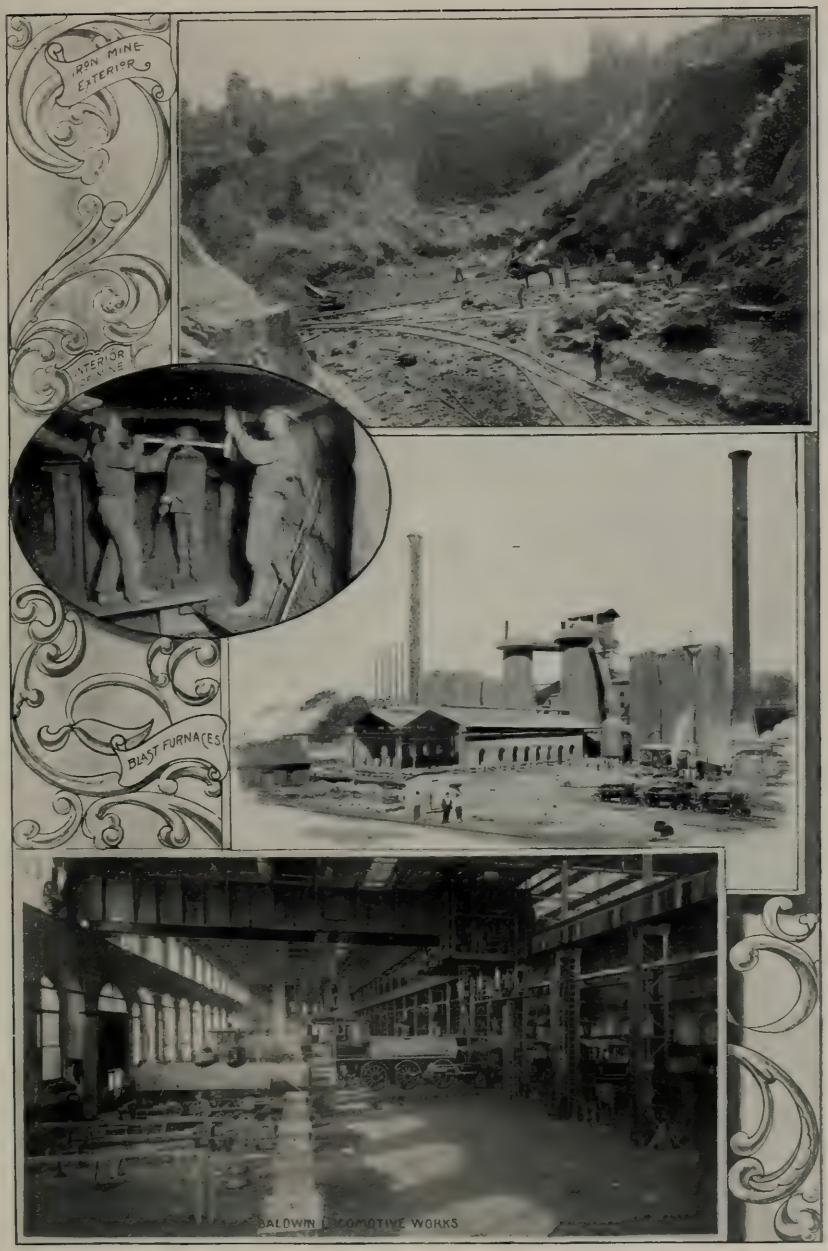
Of all the new uses of wood its employment in paper-making stands at the head. The making of wood-pulp is one of the great inventions of the nineteenth century, and the applications of this material are growing at so rapid a rate that in the time to come they may go far to exhaust the forests of the world. Its great use is in paper-making. The modern newspaper and book are eating into the forests like a conflagration. When it is considered that more than 20,000 different newspapers are published in the United States alone, some of them of great size and with a daily issue of from one to several hundred thousand copies, that there are magazines of equally great circulation, and that of the myriad of books now issued some of them reach more than a half million copies, we may comprehend the vast demand which the reader makes upon the forest.

In the manufacture of wood-pulp veinous trees are employed, the spruce in particular, on account of its cheapness and its adhesive gum. There are two modes of manufacture, known as the ground or mechanical, and the chemical wood-pulp. Ground pulp is made by pressing the logs against emery wheels or grindstones revolving swiftly under water. The wood is thus reduced to a fine wet saw-dust, which needs to be mixed with a portion of chemical pulp or other fibrous material to enable it to hold together. The paper made from this pulp is cheap but poor, and is mainly used for newspapers and cheap wrapping papers.

Chemical Wood-Pulp.

In the making of chemical wood-pulp, both spruce and poplar are commonly used. Logs with few knots are preferably chosen, sawed into lengths of about four feet, and cut in fine slices by a chipping machine. These are then placed in great tanks, or digesters, caustic soda ash being added to the water if poplar is used, and bi-sulphite of lime for spruce. Then live steam is introduced under about 110 pounds pressure, and boiling is kept up for eight or ten hours. The liquor is next washed out, and the pulp converted into paper on the usual paper-machine.

Book and magazine papers are now made almost wholly from chemical wood-pulp, the old rag-paper being quite insufficient in quantity, and used principally for the higher grades of paper. But the use of wood-pulp is not confined to paper-making. It is coming into use as a substitute for wood or tin in dozens of common articles, including basins, plates, pails, and other small wares. One of its uses is in the making of car wheels, the pulp being forced in under great pressure between the rim, hub, and side-plates. It reduces the vibration of the wheel and thus makes it more durable. Wood-pulp bricks have been manufactured, the pulp



THE IRON INDUSTRY

From the mine to the complete tool and machine is now a series of operations so nicely perfected and operated on such a large scale that results are marvelous, both in the quantities produced and in the cheapness of manufactured articles. The several steps are here shown.

being chemically treated and moulded under a pressure of 2,000 pounds to the square inch. The bricks thus made are cheap, tough, and solid. Pipes and drain-tiles are made by a similar process, and even barrels are now made of wood-pulp. Another strange use for this serviceable material is in the manufacture of telegraph poles. These are made in the form of hollow tubes, and are strong and more sightly than the usual crooked poles.

Coffins have been made of wood-pulp, so that the grave itself is invaded by this new material. In fact, there is no end of the articles which may be made from it. One of the most remarkable of them is an excellent substitute for silk, in which the pulp is forced by heavy pressure through minute holes in a metal plate, issuing in fine silky threads closely resembling those of the spider itself. Another modern use of wood is the extraction from it, by chemical means, of cellulose, a substance which forms the principal mass of the cell-membranes of all plants. A homogeneous form of this substance is produced by treating it with nitric acid, yielding the powerful explosive known as nitro-cellulose, or gun-cotton. This, dissolved in alcohol and ether, yields the collodion which is so largely used in photography. In 1870 it was found that gun-cotton could be dissolved in melted gum-camphor, yielding a body solid at ordinary temperatures and possessing remarkable properties. This, under the name of celluloid, is made into numerous articles, such as collars, cuffs, artificial teeth, cutlery handles, billiard balls, imitation coral, ivory, tortoise-shell, agate, etc. The Japanese imitate ivory with it so perfectly that it is not easy to distinguish their carved celluloid from actual ivory.

SCIENCE IN THE USE OF METALS

The most desired of the metals is gold; the most important is iron. It is the most abundant and the most useful. Man owes his civilization to iron. Before it was known he was a savage using weapons and tools of stone. The first steps in civilization were made after bronze was discovered, but all the higher stages belong to what is called the Iron Age. This is due to the fact of the great abundance of this metal, the ease with which it can be wrought into tools and machines, its hardness and toughness. If we add to iron about 1.5 per cent. of carbon, it is converted into the very hard substance called steel, which of old was largely used in making the weapons of war, but is now employed for so many purposes that we might justly call this the Age of Steel.

Iron and Its Ores.

Iron ore is found in great abundance in very many parts of the earth. Some of the substances which man uses, such as coal, may in a few centuries be exhausted; but iron is inexhaustible. The United States possesses it in vast quantities. It is found throughout the whole Appalachian mountain system, with its length of over 1000 miles, and its average breadth of seventy miles, and is very rich in Pennsylvania, West Virginia, Georgia and Alabama. It is abundant in the Lake Superior region, and forms whole mountains in Missouri. There is an immense bed of manganese ore in Arkansas; Wyoming possesses iron enough to supply the world, and there are large deposits of this useful metal in other States.

Iron ore consists of oxide of iron. The most abundant ores are Hematite, or Red Oxide (Fe_2O_3) and Magnetite, or Black Oxide (Fe_3O_4). Other ores of considerable importance are Iron Pyrites, or bisulphide of iron, spathic ore, or carbonate of iron, brown iron ore, which contains brown and yellow ochres, and bog-iron ore, of which there are immense beds on Puget Sound, Washington. These ores are reduced by the use of heat, which drives off the oxygen, melts the iron, and allows it to be drawn off in the liquid state from the impurities. These are also melted, and are drawn off separate from the iron, hardening into a glassy material called slag.

Coal is used to melt the iron, so that under present circumstances the quantity of iron produced is largely dependent upon the coal. In the United States, as a rule, the

great beds of coal and iron occur close together, a fact of great advantage. This is particularly the case in Pennsylvania and Georgia.

Production of Iron.

The United States is now the greatest iron-producing country in the world. Great Britain, which was in the lead as late as 1894, produced, in 1900, 8,700,000 tons of pig-iron and Germany about 8,000,000 tons, while the United States produced, in round numbers, 13,000,000 tons. This is over one-third of the world's production, which is about 36,000,000 tons. Of this total product two-thirds, or nearly 24,000,000 tons, is now converted into steel. This is a much larger proportion than existed a few years ago, for steel is now used for many purposes in which iron was formerly employed. The steel product of the United States in 1900 was 10,600,000 tons, more than double that of Great Britain.

Coal Production.

As coal is so closely related to iron, it is important here to state the quantity produced of this indispensable fuel. The coal fields of the world, as at present known, are enormous. Those of China and Japan are estimated to cover 200,000 square miles; of the United States, 194,000; of India, 35,000; of Russia, 27,000; of Great Britain, 9,000; of Germany, 3,600; of France, 1,800; and of other countries, 1,400. This yields a total of 471,800 square miles, but says nothing of the continent of Africa, and of the American continents apart from the United States, the extent of whose coal fields is not known, but may prove very considerable.

Great Britain and the United States are the great coal producers, the annual product of each being about 200,000,000 tons. But the United States product is yearly growing, while that of Great Britain is at its topmost level, and must soon decrease, as many of its mines are nearly worked out. The remainder of the world yields about 170,000,000 tons, without counting China, whose production is unknown. Of the two varieties of coal, bituminous and anthracite, the production of the latter is nearly confined to Pennsylvania, which yields over 50,000,000 tons annually. There are said to be immense beds of anthracite coal in China, of which little is produced, since it is mined by the pick and carried to market on mule-back.

Bessemer Steel.

The greatly increased use of steel is due to the cheapness of its production by the Bessemer process. In this process a great crucible lined with fire-clay, called a converter, is used. The melted pig-iron, which contains carbon and silicon, is run into the converter, and a blast of air under pressure is driven through it. The result is that the silicon and some other impurities are burned out, and also most of the carbon, just enough carbon being left to convert the pig-iron into steel. If the carbon is too greatly reduced, malleable or wrought-iron results.

Steel was formerly made by first producing wrought-iron, and then adding the necessary quantity of carbon. This was an expensive process, but steel is now made so cheaply that it is replacing iron for railroad bars, and many other purposes. Steel which is low in carbon is called soft or mild steel, and is more easily worked than hard steel. It is used for buildings, bridges, and other structures, hard steel being used for tools.

The casting of steel is a recent process, which has greatly developed of late years. At first steel castings were full of pores, but this has now been overcome, and solid castings are produced for many purposes. One important use of steel is in the making of armor-plates for naval vessels. These were at first made of iron, but soft-steel castings began to be made for them about 1886. In the manufacture of modern armor-plates the steel billets are subjected in a heated state to a hydraulic pressure of some 7,000 pounds per square inch. This is to squeeze out all pores, condense the steel and make it solid throughout.

Great toughness is needed in armor-plates to enable them to resist the impact of shells from modern rifled cannon. It has been found that the addition of from two to four per cent. of nickel adds greatly to the resisting powers of the steel. In addition to this, processes of surface hardening are employed. What are known as Harveyized

plates, are surface-hardened plates of nickel steel, whose resistance is 438 per cent. greater than that of ordinary steel. Large forgings of nickel steel have shown tensile strengths of 95,000 pounds per square inch, with an elastic limit of 60,000 pounds. The recently-introduced Krupp plates, hardened by a secret process, are superseding the Harveyized plates.

THE WORLD'S GOLD AND SILVER PRODUCTION, 1899.

COUNTRIES	GOLD		SILVER		
	Ounces (fine)	Value	Ounces (fine)	Coining value	Commercial value
United States	3,437,210	$71,053,400	54,764,500	$70,806,600	$32,858,700
Mexico	411,187	*a* 8,500,000	55,612,090	71,902,500	33,367,300
Canada and Newfoundland	*b*1,031,563	21,324,300	3,411,644	4,411,000	2,047,000
Africa	3,542,361	73,227,100	. . . . .	. . . . .	. . . . .
Australasia	3,837,181	79,321,600	12,686,658	16,403,000	7,612,000
Russia	1,072,333	22,167,100	134,887	174,400	80,900
Austria-Hungary	94,037	1,943,900	1,895,253	2,450,400	1,137,200
Germany	3,589	74,200	6,242,053	8,070,500	3,745,200
Norway	. . . . .	. . . . .	166,908	215,800	100,100
Sweden	3,414	70,600	73,619	95,200	44,200
Italy	8,027	165,900	804,512	1,040,200	482,700
Spain	96	2,000	2,452,940	3,171,500	1,471 800
Portugal	227	4,700	3,790	4,900	2,300
Greece	. . . . .	. . . . .	*c* 1,348,411	1,743,400	795,600
Turkey	*d* 687	14,200	*d* 142,157	1 183,800	85,300
Servia	*e* 643	13,300	18,322	23,700	11,000
France	. . . . .	. . . . .	460,946	596,000	276,600
Great Britian	2,844	58,800	186,582	241,200	111,900
Argentina	6,661	*d* 137,700	383,479	*d* 495,800	230,100
Bolivia	3,311	68,500	10,843,977	14,020,500	6,506,400
Chile	43,229	*c* 893,600	4,754,636	*c* 6,147,400	2,852,800
Colombia	87,535	1,809,500	3,521,563	4,553,100	2,112,900
Ecuador	2,317	47,900	7,734	*d* 10,000	4,600
Brazil	103,983	2,149,500	. . . . .	. . . . .	. . . . .
Venezuela	52,694	*c* 1,089,300	. . . . .	. . . . .	. . . . .
Guiana (British)	98,712	2,040,500	. . . . .	. . . . .	. . . . .
Guiana (Dutch)	28,423	587,600	. . . . .	. . . . .	. . . . .
Guiana (French)	81,691	1,688,700	. . . . .	. . . . .	. . . . .
Peru	30,380	628,000	4,722,687	*c* 6,106,100	2,833,600
Uruguay	*c* 1,664	34,400	. . . . .	. . . . .	. . . . .
Central America	28,263	584,200	924,695	1,195,600	554,800
Japan	38,253	790,800	1,660,200	2,146,500	996,100
China	269,662	5,574,400	. . . . .	. . . . .	. . . . .
Korea	70,579	1,459,000	. . . . .	. . . . .	. . . . .
India (British)	412,032	8,517,500	. . . . .	. . . . .	. . . . .
East Indies (British)	20,562	425,100	. . . . .	. . . . .	. . . . .
East Indies(Dutch)	5,689	117,600	. . . . .	. . . . .	. . . . .
Total	14,831,039	306,584,900	167,224,243	216,209,100	100,321,100

a Estimate, Bureau of the Mint.
b Newfoundland product for 1897 included.
c Figures for 1898 repeated.
d Figures for 1897 repeated.

Uses of Iron.

The uses of iron are so innumerable that it would need a considerable part of this work even to name them all. No other metal could replace it, for no other has its many valuable qualities. The tools and weapons of mankind for ages past have been made of iron. In the far past the smith held the highest position among the world's workers. The tools of the farmer, the builder, and other artisans, the sword and shield of the warrior, the armor of the knight, were made of steel or iron. In our days the use of iron has enormously increased. In our factories and workshops are thousands of iron machines, our houses

contain iron stoves, furnaces, and utensils. Iron is replacing wood, brick, and stone in the erection of great buildings; we have iron bridges, iron ships, iron locomotives, and are beginning to make cars of sheet steel. In short, iron is the one thing indispensable to modern civilization.

Iron is not confined to the earth: it extends throughout the universe. The meteorites which fly in all directions through space, and now and then fall upon the earth's surface, are largely made up of pure iron. One of these now in Yale College, which weighs 1635 pounds, contains about 90 per cent. of iron. Another place where iron is found, and where it is of great utility, is in the blood of vertebrate animals. It is iron that gives the red color to our blood. The actual quantity is small. The blood of a man who weighs 140 pounds contains about 38 grains of iron. It is found in the red blood corpuscles, and is supposed to carry oxygen from the lungs through the body. What other service it performs we do not know, but its presence is necessary to health, and in certain conditions of the system iron serves as a valuable medicine.

Iron and Gold.

Iron, while the most abundant and useful of the metals, is only one among many, each of which has some valuable quality of its own, while most of them are superior to iron in one particular—that of resistance to oxidation. Iron when wet or moist is very susceptible to the attacks of oxygen, which converts it rapidly into rust, or iron oxide, and destroys its usefulness. This is not the case with the metal with which we are now concerned—gold, the chief of the precious metals. It resists oxygen under all ordinary circumstances, and, therefore, is usually found in its pure or native state, while iron is found only as an oxide or other chemical compound, except in the case of the native iron which falls to the earth from space in meteorites.

Gold, while very rare as compared with iron, is almost as widely diffused. Traces of gold can be found almost everywhere in

GOLD AND SILVER PRODUCTION OF THE UNITED STATES, 1899.

STATE OR TERRITORY	GOLD		SILVER		
	Quartz	Placer	Quartz	Lead Ores	Copper Ores
	Fine Ounces	*Fine Ounces*	*Fine Ounces*	*Fine Ounces*	*Fine Ounces*
Alabama	47	183	50	. . . . .	. . . . .
Alaska	119,720	151,277	177,383	. . . . .	. . . . .
Arizona	117,011	8,667	1,118,251	115,074	631,491
California	570,198	171,682	389,162	109,732	356,975
Colorado	1,238,528	31,765	5,279,741	*a*17,675,637	. . . . .
Georgia	3,390	2,275	446	. . . . .	. . . . .
Idaho	70,842	31,264	1,022,192	3,064,221	. . . . .
Maryland	57	. . . . .	2	. . . . .	. . . . .
Michigan	4	. . . . .	. . . . .	. . . . .	112,823
Montana	204,300	28,827	4,455,488	2,504,695	9,890,572
Nevada	119,975	910	730,629	179,070	50,818
New Mexico	38,470	2,900	201,585	125,000	200,000
North Carolina	689	1,280	5,529	. . . . .	. . . . .
Oregon	57,097	13,887	93,353	50,000	2,000
South Carolina	7,558	197	402	. . . . .	. . . . .
South Dakota	313,037	. . . . .	185,992	. . . . .	. . . . .
Tennessee	. . . . .	8	1	. . . . .	. . . . .
Texas	333	. . . . .	519,972	. . . . .	. . . . .
Utah	169,631	. . . . .	1,542,702	5,028,660	611,745
Virginia	205	169	189	. . . . .	. . . . .
Washington	30,894	4,390	138,161	148,500	3,000
Wyoming	. . . . .	1,277	. . . . .	. . . . .	. . . . .
Total	3,062,286	450,958	15,861,230	29,000,609	11,859,334

a Lead and Copper Ores.

the clays and sands of the earth, while vast quantities of it exist dissolved in the waters of the ocean. But there are few places where it is plentiful enough to pay for the labor of extracting it. Absurd ideas have been entertained of gaining riches by getting the gold from sea-water, but as there are only a few grains of the precious metal in a large volume of water, the cost would far exceed the result. Therefore, though gold may exist under our feet in every section of the earth, there are not many regions where it pays to seek for it.

APPROXIMATE AMOUNT OF MONEY IN THE WORLD IN 1899.

COUNTRIES	Monetary System	Ratio Between Gold and Full Legal Tender Silver	Ratio Between Gold and Limited Tender Silver	Gold Stock	Silver Stock	Uncovered Paper	PER CAPITA			
							Gold	Silver	Paper	Total
United States*	Gold and Silver	1 to 15.98	1 to 14.95	$962,900,000	$639,600,000	$319,500,000	$12.65	$8.40	$4.20	$25.25
United Kingdom	Gold		1 to 14.28	462,300,000	111,900,000	111,600,000	11.50	2.78	2.77	17.05
France	Gold and Silver	1 to 15 1-2	1 to 14.38	810,600,000	420,100,000	161,100,000	21.05	10.92	4.18	36.15
Germany	Gold		1 to 13.957	672,800,000	208,200,000	156,700,000	12.86	3.98	3.00	19.84
Belgium	Gold and Silver	1 to 15 1-2	1 to 14.38	30,600,000	45,000,000	82,500,000	4.54	6.82	12.50	23.86
Italy	Gold and Silver	1 to 15 1-2	1 to 14.38	98,000,000	43,900,000	174,900,000	3.09	1.38	5.52	9.99
Switzerland	Gold and Silver	1 to 15 1-2	1 to 14.38	24,000,000	10,700,000	17,400,000	7.74	3.45	5.61	16.80
Greece	Gold and Silver	1 to 15 1-2	1 to 14.38	500,000	1,500,000	29,100,000	.21	.62	12.12	12.95
Spain	Gold and Silver	1 to 15 1-2	1 to 14.38	53,400,000	37,800,000	187,500,000	2.92	2.06	10.24	15.22
Portugal	Gold		1 to 14.08	5,200,000	9,600,000	75,200,000	1.02	1.88	14.74	17.64
Roumania	Gold and Silver			13,100,000	7,100,000	20,200,000	2.42	1.31	3.75	7.48
Servia	Gold and Silver			1,000,000	1,800,000	3,600,000	.41	.75	1.50	2.66
Austria-Hungary	Gold		1 to 13.69	221,400,000	147,300,000	103,000,000	4.82	3.21	2.24	10.27
Netherlands	Gold and Silver	1 to 15 5-8	1 to 15	30,200,000	56,400,000	47,200,000	6.04	11.28	9.44	26.76
Norway	Gold		1 to 14.88	8,600,000	2,300,000	5,100,000	4.10	1.09	2.43	7.62
Sweden	Gold		1 to 14.88	13,000,000	6,500,000	29,500,000	2.60	1.30	5.90	9.80
Denmark	Gold		1 to 14.88	16,900,000	5,400,000	5,900,000	7.35	2.35	2.56	12.26
Russia	Gold		1 to 23.24	740,400,000	81,900,000		5.69	.63		6.32
Turkey	Gold and Silver	1 to 15 7-8	1 to 15 7-8	50,000,000	40,000,000		2.07	1.66		3.73
Australasia	Gold		1 to 14.28	132,100,000	7,000,000	22,500,000	25.90	1.37	4.41	31.68
Egypt	Gold		1 to 15.68	30,000,000	6,400,000		3.06	.65		3.71
Mexico	Silver	1 to 16 1-2		8,600,000	106,000,000	4,000,000	.66	8.15	.31	9.12
Central Am. States	Silver			1,000,000	11,400,000	18,100,000	.30	3.55	5.32	8.97
South Am. States	Silver†	1 to 15 1-2		72,700,000	29,000,000	1,159,300,000	1.91	.76	30.51	33.18
Japan	Gold		1 to 32.36	54,000,000	25,300,000		1.20	.55		1.75
India	Silver	1 to 15			568,400,000	47,400,000		1.91	.16	2.07
China	Silver				750,000,000			1.96		1.96
Straits Settlements	Silver				242,000,000			53.82		53.82
Canada	Gold		1 to 14.28	20,000,000	5,000,000	40,500,000	3.70	.93	7.50	12.13
Cuba	Gold and Silver	1 to 15 1-2		2,000,000	1,500,000		1.11	.83		1.94
Hayti	Gold and Silver	1 to 15 1-2		1,200,000	3,500,000	3,700,000	1.20	3.50	3.70	8.40
Bulgaria	Gold and Silver	1 to 15 1-2	1 to 14.39	1,000,000	6,800,000		.30	2.06		2.36
Siam	Silver			20,000,000	193,400,000		4.00	38.68		42.68
Hawaii	Gold and Silver	1 to 15.98	1 to 14.95	4,000,000	1,000,000		40.00	10.00		50.00
Cape Colony	Gold		1 to 14.28	37,500,000	1,000,000		17.86	.47		18.33
S. African Rep	Gold		1 to 14.28	29,200,000	1,200,000		26.54	1.09		27.63
Finland	Gold		1 to 15 1-2	4,100,000	500,000	10,800,000	1.58	.19	4.15	5.92
Total				4,631,700,600	3,836,100,000	2,836,300,000	3.51	2.91	2.15	8.57

*July 1, 1899. †Except Venezuela, Chile and Peru.

Gold, Its Character and Sources.

Gold is a metal of a beautiful yellow color, quite soft, and extremely ductile and malleable. It is very heavy, its specific gravity being over 19¼, while that of iron is 7.8439, much less than half the weight of gold. It melts at 2192° F., and begins to volatilize at a little higher temperature. It does not tarnish in the air, even when melted, and no acid attacks it, but it may be dissolved by a mixture of nitric and hydrochloric acids, the chlorine set free from the latter being the active agent.

There are two sources of the gold of commerce, one being the quartz of mountain rocks, in which it occurs in veins, the gold being found in strings, plates, scales, and small masses. But while the native home of gold is the quartz rock, it is most commonly gathered from the gravel or sands of alluvial deposits, in which it occurs in the form of flattened scales and grains, the latter varying in size, and sometimes composing what are known as nuggets. While these are not usually of much size, some very large ones have been found. In 1861 a nugget weighing 201 ounces was found in California, while the Russian diggings have yielded a nugget weighing 96 pounds Troy. Still larger are the Blanch Barkley nugget

from Australia, weighing 140 pounds, and the Welcome Nugget, found at Ballarat, which weighed 184 pounds 8 ounces, and yielded $41,882.62 worth of gold.

The Placer Gold Fields.

The great placer gold fields outside the United States, are in Australia and Siberia. Within the United States California has long been the principal gold-yielding State, the other important States being Colorado, Montana, Idaho, Nevada, and South Dakota. In the East small quantities of gold have been found in the Carolinas and Georgia. Our new Territory of Alaska has recently developed as a country ric' in gold, and may eventually prove one of the leading gold fields of the earth. The Philippines may also become a valuable source of gold. In California the placer deposits have been worked so diligently as to be in some measure exhausted, and the mining fraternity are now attacking the mother veins, with costly apparatus and the use of large capital. Arizona also gives promise of being rich in gold, and the miners are now congregating on its arid soil. In South Africa, the gold occurs in rock ledges, and needs to be obtained by mining processes.

As regards the origin of the placer or alluvial deposits, it may be said that they are the result of the denudation of the hills and the carrying down of this mineral matter by rain rivulets to the streams. The gold remains undissolved in the water and its great weight causes it to sink and collect on the bottom of the streams. As a result many of the richest placer deposits are the dry beds of old rivers. At Cape Nome, Alaska, the gold-bearing sands have been carried to the sea, and afterward thrown up by the waves on the beach.

Production of Gold.

The United States and Australia have long held the leading place in gold production, but of late years the yield of the gold reefs of the Transvaal, South Africa, has largely increased, and in 1898, the year preceding the recent war, the Transvaal gold stood at the head. A previous table shows the world's gold and silver harvest.

In North America the region of Alaska and the adjoining district of Canada have of late years come into the field as important gold producers, the yield of the Klondike and Cape Nome fields in the year 1900 being about $17,000,000, with large future possibilities.

The total production of the precious metals since the discovery of America in 1492 is estimated in money value at $9,508,317,200 for gold, and $10,972,431,400 for silver. Of these great sums three-fourths the gold and more than half the silver were the product of the nineteenth century. There is no falling off in the harvest of these metals, the yield being steadily growing greater. As regards their use, though they are very largely employed as coined money, large quantities of them are consumed in the arts. In the year ending July 1, 1900, the world consumed in this direction $72,658,500 worth of gold and $52,990,500 of silver, while the coinage of the nations amounted to $466,110,614 in gold and $166,226,964 in silver. The total value of the precious metals in the world at that date was, gold, $4,841,000,000; silver, $3,818,900,000.

Placer Mining.

The methods of mining in placer deposits of gold was long very simple. The "golden fleece" of the Greek legend is supposed to have been a sheepskin pegged down in the current of the Phasis River to entangle in its wool the grains of gold borne down by the water. Sheepskins are still used for this purpose in Hungary, Savoy, and Ladakh, and ox-hides in Brazil. In California a simple pan was first used to wash the gold from the sand and clay. Gold being about seven times as heavy as the other materials of the river bed, it sank to the bottom, while those were washed away. Then the cradle, or rocking trough, came into use; afterwards the flume, a sort of wooden ditch, of great length, with catch basins to arrest the gold as the water carried away the debris. In "hydraulic mining" the raised beds of old rivers were washed away by water conveyed in tubes and hurled against them with great force. In one district in Victoria over 33,500 tons of

wash-dirt were treated in three months for an average yield of 18½ grains of gold per ton—about one part in 700,000.

Vein Mining.

Vein mining for gold is now the chief method employed in the United States, and is the only one in use in South Africa. In this the vein-stuff, after being mined from the rocks, is crushed to powder under the hammers of stamp mills or in powerful rolling mills. It is then treated like placer dirt, being washed in troughs with catch-pockets, in which mercury is used to amalgamate with and hold the fine particles of gold.

This is the old method, but new methods are now in use which save far more of the gold and allow ores which were formerly abandoned to be worked with profit. The *Chlorine process* employs an electric current as an aid to rapid amalgamation. The crushed ore is mixed with salt water in a caldron in which a revolving apparatus keeps the liquid in constant motion. From the revolving arms an electric current passes to a dish of mercury in the bottom. The current decomposes the salt, or chloride of sodium, its sodium going to the mercury, while its chlorine rises and dissolves the fine floating gold. A secondary action follows, the electric current now decomposing the chloride of gold. The gold goes to the mercury and is amalgamated; the chlorine rises and dissolves more gold, and thus the process is continuously repeated. Chlorine is not the only substance used, cyanogen being also employed. In one *cyanide process* a mixture of potassium cyanide and cyanogen bromide is used with remarkable results. By these methods low-grade ores, which formerly it did not pay to work, can now be profitably reduced. This is the case with the South African ores, which are too low in gold to be worked with profit by the old methods.

Silver Mining.

What has been said of the yellow metal, gold, applies in a measure to the white metal, silver, except that the latter is worked only from the rock, since it does not occur in placer deposits. Silver is frequently found in the native state, though it is generally alloyed with gold, arsenic, and antimony. The native alloy in the great Comstock lode of Nevada contains about 43 per cent. of silver. The galena ores of the United States, except those of the Mississippi Valley, nearly all contain native silver in quantities varying from 0.10 to 3.00 per cent. In these the mixture is heated till the lead melts and floats away, carrying with it the silver, while a spongy mass of copper remains. The rich alloys are reduced by the process of amalgamation. Great single masses of native silver have been found. At Freiberg, in Saxony, a mass weighing 140 pounds was discovered; while in the Copenhagen Museum is a lump weighing 560 pounds. Another piece nearly three times as heavy has been found.

There are numerous ores of silver, of which the most important are Argentite, or Sulphide of Silver; Sulphanite and Pyragyrate, or Sulph-antimonites of Silver; Proustile, or Sulph-arsenite of Silver; Chloragyrite, or Chloride of Silver and Embolite, or Chloro-bromide of Silver. The great silver-producing region of the United States was discovered as late as 1859. The lodes occur in the Rocky and Sierra Nevada Mountains, in the States of Nevada, Montana, Idaho, California, Colorado, and Utah, and the Territories of Arizona and New Mexico. Outside the United States silver occurs abundantly in Mexico and in parts of the Andes of South America, and in various sections of the Eastern Hemisphere. The production of silver has enormously increased since the discovery of the rich deposits in Western North America. Mexico rapidly rose to the head as the greatest silver-producing country of the world, and it retains this position, though it is closely approached by the United States. Nevada, formerly the great silver region of this country, has now decidedly fallen off, and Colorado and Montana have risen to the head of the silver States. The subjoined table shows the production of gold and silver in the several sections of the United States for the year ending January 1, 1900.

In conclusion of our treatment of the precious metals, we give, in the foregoing

table, the approximate amount of money in the world, as compiled from the report of the Director of the Mint for January 1, 1900.

Copper Production.

Though copper occurs in many parts of the earth, the whole world looks to the United States for its main supply of this important metal. This country contains three enormous deposits of copper in the Lake Superior region, at Butte, Montana, and in Arizona, while smaller quantities are found in New Mexico, Colorado, Vermont, and some other States. In the rich mines of Lake Superior native copper is found, and large masses have been obtained. These mines were worked by the Mound Builders long before white men came to America, copper being the only metal they possessed. It is now found in this region in the form of nodules or sheets, distributed through the veins. In Montana, the copper occurs in granite, usually in connection with silver. In Arizona, it is found in the form of oxides and carbonates. The world's production of this metal in 1898 was 434,239 tons, of which 239,241, or more than half, were mined in the United States. Spain and Portugal came next, with 53,225 tons. In the United States, the yield of Montana was 96,861, of Michigan 69,942, and of Arizona 53,940 tons.

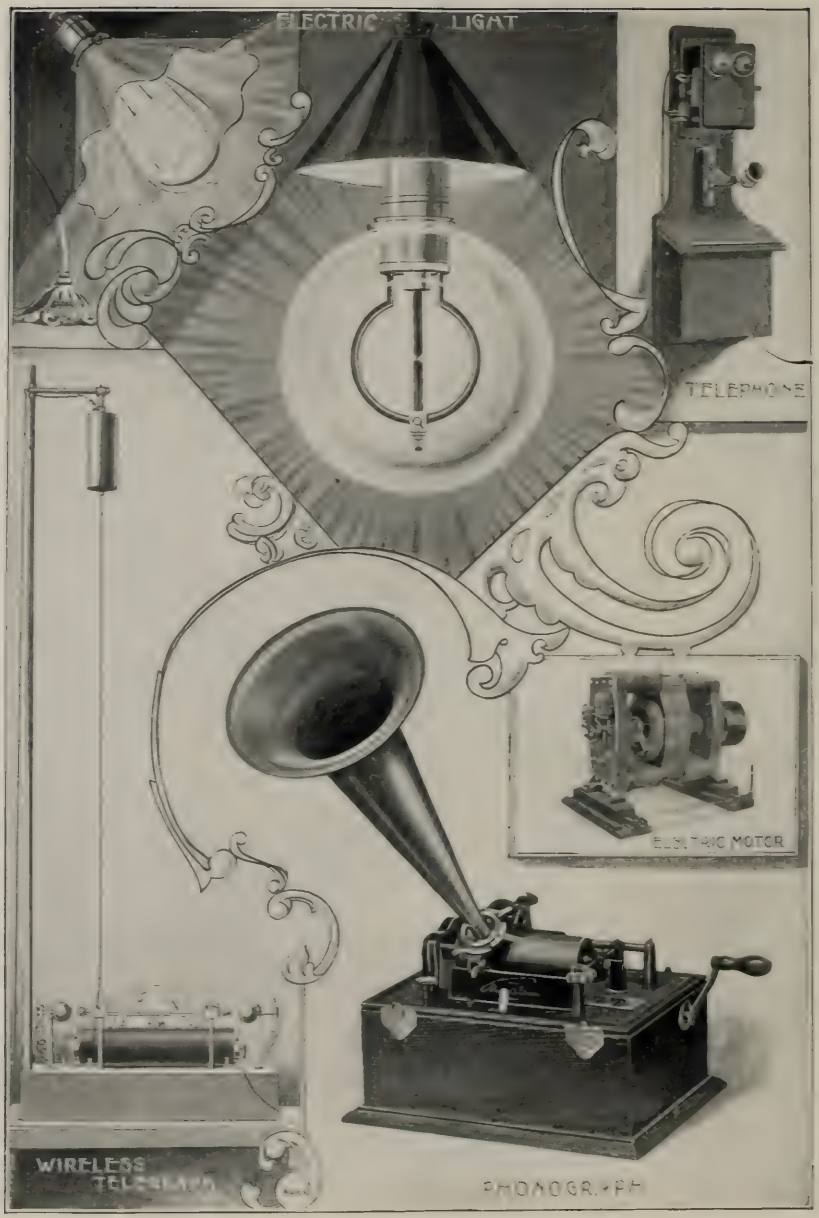
Copper is a metal used for many important purposes in the arts, large quantities of it being employed in sheathing ships and in the manufacture of boilers and utensils for domestic purposes. A highly valuable property is the fact that it is one of the best conductors of electricity, silver being its only close rival in this field. As a result, copper has come widely into use as a material for trolley-car wires, and in all other cases where large quantities of electricity need to be conveyed. Alloyed with zinc, it forms the very useful substance, brass, while with different proportions of tin it forms bronze, bell-metal, gun-metal, and speculum-metal.

Lead Production.

Lead, the softest of the metals in common use, and one of the most easily melted, owes much of its usefulness to these qualities. It can be readily rolled into thin sheets and drawn into tubes or pipes. For one of its extensive uses, the covering of roofs, its weight and fusibility are against it, since it melts easily, and the fall of the molten lead, in the case of a fire, is apt to spread the conflagration. The chief ore of this metal is galena, or sulphide of lead. This is found in extensive veins in parts of England and Spain, while sulphide of lead is abundant in Australia. Galena exists in large deposits in Illinois, Missouri, Iowa, and Wisconsin, and in smaller quantities in many other States. In Colorado, Utah, Idaho, and Montana lead abounds in the silver-mining districts, and the production of silver yields it in such large quantities as a by-product, that in this metal, as well as in copper, the United States is the largest producer in the world. The annual production of this country is about 200,000 tons.

Tin, Its Production and Uses.

The white metal tin is, like lead, easily melted and is extremely malleable at a temperature of 212°. It has a great tendency to crystallize, and when bent yields a peculiar cracking sound called "the cry of tin," which is due to the friction of the internal crystals. The principal tin-yielding regions have long been Cornwall, England, and Banca, in the Dutch East Indies. Of recent discovery are large deposits in the Malay Peninsula and in parts of Australia. In past times the British Islands were known as the Tin Islands, from their wealth in this useful metal. Tin sometimes occurs in the native state, but commonly as an oxide, which is known as tin stone, wood tin, stream tin, or kasseterite. From this ore tin is obtained by stamping and roasting in a furnace at a moderate temperature. Deposits of tin have been found in the United States at South Riverside, California, in the Black Hills of South Dakota, and in localities of Virginia and North Carolina, but in none of these has mining proved profitable. The world's production of tin in 1898 was 73,268 tons, of which 45,901 tons came from the Malay Peninsula, 14,380 from the Banca district, 4,200 from Cornwall, 4,464 from Bolivia, and 3,220 from Australia.



THE MARVELS OF MECHANICAL INVENTION

Electricity as applied to light, sound and power has wrought more marvelous changes than any other factor of modern times. The representative of each is shown here. The nicety of mechanical invention and adjustment required for these appliances is perhaps the most remarkable of all mechanical devices

The uses of tin are so well known that we need only glance at them. Its resistance to oxidation renders it very useful as a coating for iron, and this combination, known as tin-plate, is employed for a large number of purposes. It is abundantly used for the canning of fruits and other food stuffs. Formerly Wales was the centre of the tin-plate industry, but under the McKinley tariff of 1891, its manufacture was begun in the United States, and it has now grown into an important industry. In 1897, there were about 7,000,000 boxes of plate produced, holding 112 plates to the box, a supply sufficient to meet the home demand. About one-quarter of this demand comes from the Standard Oil Company and the Armour Packing Company, while the remainder is mainly used in roofing and in tin boxes and cans for various purposes.

Tin forms a large number of alloys with other metals, yielding Britannia metal, pewter, solder, bell-metal, bronze, gun-metal, speculum-metal, etc. Tinfoil is an alloy of lead and tin, beaten to great thinness, for use in wrapping up and excluding the air from small articles. The thinnest foil is one two-thousandth of an inch in thickness. If articles of food are to be wrapped, only pure tin is admissible, lead in contact with food being dangerous. Tinfoil is often embossed, lacquered with gold, printed in colors, and otherwise ornamented, being often made very beautiful.

Zinc.

The bluish-white metal, zinc, is quite malleable and ductile at temperatures of 200° to 300°, and melts at 773°. Its ores are found abundantly in many parts of the earth, and in ancient times the alloy of zinc and copper was in use in the form of brass, though zinc, as a separate metal, was not known in Europe until after 1700. It seems to have been known much earlier in China. Its total production in 1898 was 467,749 tons, of which Germany yielded 191,836 and Upper Silesia, 99,232 tons, while smaller quantities came from Austria, the Netherlands, France, Spain, Russia, and England, and 103,514 tons from the United States. In the form of red ore it occurs in New Jersey, and as Calamine, or carbonate of zinc, near Lancaster, Pennsylvania.

Zinc has long been used as one of the constituents of brass, and has of late come largely into use as a coating for iron, in what is known as galvanized iron. It forms, alloyed with copper, a part of the material of all our pins. Other uses are as a protective covering of floors under stoves, and as a lining for bath-tubs. The oxide is largely used to adulterate or replace white lead in paints.

Nickel.

This metal was not known till 1751, when it was discovered by Cronstedt, who called it kupfer-nickel, or old Nick's Copper. It is a brilliant white, ductile metal, nearly as infusible as iron, with which it shares the property of magnetic attraction. It is associated with iron in meteorites, being one of the metals which come to us from space. Its great resistance to oxidation renders it very useful for the plating of steel instruments, and for coating chemical vessels and cooking pots of iron. Nickel-plating has become one of the necessary arts of modern times. A new and important use for nickel is an alloy for steel in the plating of war-vessels, a small percentage of this metal greatly increasing the hardness of the armor. It forms useful alloys with copper and zinc, of which German silver and some white compounds used in coining are the most important. Our nickel half-dime is a daily handled example.

Mercury or Quicksilver.

The ancients were acquainted with only seven metals, and of these the glittering liquid mercury formed one. With the exception of bromine, it is the only element that exists in a liquid state at ordinary temperatures. It occurs in nature in the form of cinnabar, or sulphide of mercury, which for ages past has been worked at the famous mines of Almaden, in Spain. Other mines are at Idria, in Transylvania, and New Almaden, in California, and it is also found abundantly in China, Japan and Peru. In obtaining mercury from cinnabar the sulphur is burned out and the metal obtained by distillation. In another method

the ore is mixed with iron-filings or lime, the sulphur combining with the iron or calcium and leaving the metal free.

The uses of mercury are numerous and important. With many metals it forms a pasty mass called amalgam, a property which is taken advantage of in the mining of gold and silver, as already described, also in gilding and the making of mirrors. Its great increase in volume between the freezing and boiling points of water renders it very useful in the thermometer, and its weight makes it of value in the barometer. Its ore is of use in the red paint called cinnabar, and its compound with chlorine yields us the useful medicine calomel.

Aluminium.

It is a singular circumstance that one of the most abundant, and what promises to be one of the most useful, of the metals was not known to exist a century ago. Buried in enormous quantities in the clay of the earth, it lay hidden for uncounted generations, waiting for the chemist of the nineteenth century to trace it to its lair and bring it forth for man's use. Combined with oxygen it gives us alumina, of which we have splendid examples in the precious gems sapphire and ruby, and useful ones in the very hard substances corundum and emery. Alumina combined with silica forms the basis of all varieties of clay, and is thus found almost everywhere in the upper strata of the earth's surface.

In 1827 the chemist Wœhler first obtained this well-hidden metal, and again, more perfectly, in 1845, but it was not until 1854 that Deville obtained it nearly pure and discovered its properties. He employed potassium, and afterwards sodium, as the reducing agent, and its production was so cheapened that works to manufacture it were started in France, England and the United States. It was still a costly product, its price being $30 a pound in 1857, $17 in 1860, and $12 as late as 1885. In the year 1884 a cap of aluminium made in Philadelphia, was placed upon the lofty Washington Monument.

In 1886 a new process of reduction of the ore was employed, and since then this metal has been produced in the electric furnace, a powerful current being sent through carbon poles, with the result of rapidly separating the metal from the clay. In one of these furnaces 400 pounds of Aluminium a day may be produced. In a few years the price fell to less than 60 cents a pound, and in 1895 the yield in America was 900,000 pounds and in Europe much greater. In 1897 it had increased in the United States to 4,000,000 pounds, in 1898 to 5,200,000 pounds, and is steadily increasing in quantity and falling in price. This is largely due to the use of the great electrical power plant at Niagara in its production.

Aluminium is a white metal, remarkable for its low specific gravity, which is 2.5 to 2.67, its weight being but one-third that of iron and less than one-seventh that of gold. This, and its resistance to oxidation, render it very useful in situations where the heavier metals could not be used. The most striking illustration of this is its employment as an external coating for the immense tower of the Philadelphia City Hall. It is used for many other purposes where lightness is desirable, as in the manufacture of bicycles and racing boats. A recent effort was made to reach the North Pole in aluminium boats. Of the alloys of this metal, those made with copper are very hard, and take a high polish. One of these, in which there is about 10 per cent. of aluminium, is of a beautiful golden-yellow color, and is manufactured under the name of aluminium bronze. It is used for table cutlery, in place of silver-plated ware, for watch chains, carriage mountings, metallic fittings, screw propellers, etc. Aluminium also forms a white alloy with copper, zinc, silicon, and manganese, which is known as silver bronze, and is used to replace German silver. It is very strong and has great electrical resistance, and is drawn into tough wire for resistance coils. An alloy with chromium is as hard as steel, and one with 70 per cent. of iron is hard enough to scratch glass.

Alum, the important chemical substance from which this metal gets its name, is a sulphate of aluminium and potassium.

Other Metals.

There are numerous other metals known to chemistry, but none of such practical importance as those named. All of these have

been discovered within the nineteenth century and many of them are very costly in their pure state, some of them being far more high priced than gold. Sodium is best known in the forms of its carbonate—the common soda which is used for so many purposes; and its chloride, or common salt, which exists in immense quantities dissolved in the waters of the ocean, or deposited as rock salt in the crust of the earth. The metal Potassium is the basis of another important alkali, that known as Potash, a highly useful chemical product. Magnesium is the basis of the substance magnesia, best known as a medicine. Calcium is a metal existing in the common and very useful substance lime, which is known in chemistry as oxide of calcium. This metal burns freely and brilliantly, and the same may be said of magnesium, each yielding a flashing light, of use in photography. A recent product of Calcium is the carbon compound known as Calcium Carbide, made in the electric furnace, and the source of the brilliantly illuminant acetylene gas. Platinum, one of the rare metals, finds its chief use in its high melting point and great resistance to heat. Costly as it is, it is indispensable for crucibles which are to be exposed to intense heat. It is also of important use in the incandescent electric light, in which platinum wire is sealed into the glass bulb and conveys the current. It is the only substance that can be used without breaking the bulb.

Petroleum or Rock Oil.

We must now speak of what may be called liquid mining,—the obtaining of a mineral substance in a liquid state whose abiding place is often deep within the crust of the earth. This substance, known as Petroleum, or Rock Oil, is no new discovery. For ages past it has been making its way to the surface in certain localities, and has long been used for lighting purposes at Baku, on the Caspian Sea, and for other purposes by the Indians on the Alleghany River. It is also now found at Rangoon, in Burmah, at places in Austria, Sumatra, Java, Trinidad, Japan, Peru, and Canada, and in Ohio, Virginia, California, and other American States.

The mining for petroleum began in 1859, when Colonel Drake bored the first wells at Titusville, on Oil Creek, Pennsylvania, and obtained a yield of 1000 gallons of oil a day. This gave rise to the "oil fever," in which thousands of wells were sunk, and vast quantities of oil obtained. Of the other localities in which rock oil is found, the most important is Baku, in Russia, on the western shore of the Caspian Sea, which yields immense quantities of a heavy oil. The percentage of burning oil in this is small, but its cheapness renders its distillation profitable. In 1870 the Standard Oil Company was formed by Rockefeller, Andrews, and Flagler, of Cleveland, Ohio. This has now become the Standard Oil Trust, and controls the whole vast product of the American oil fields. The oil, instead of being carried by railroad, is sent through pipes, hundreds of miles in length, to the sea-coast and other refining centres, where the crude material is prepared for use. Though the exhaustion of the oil wells has often been predicted, the production of the United States doubled between 1890 and 1900. The total world's product is now over 5,000,000,000 gallons yearly, of which 2,500,000,000 are produced in the United States, 2,250,000,000 in Russia, and the remainder principally in Austria, Sumatra, Java, and Canada.

Uses of Petroleum.

The most important use of petroleum is as an illuminant. For this purpose it is refined by distillation. A light oil, composed of gasoline and naphtha, first rises, and is condensed, the naphtha being afterwards converted into benzine. The remaining substance is again distilled, yielding, when refined, the valuable colorless illuminating oil. When this has been taken off fresh steam is forced into the retort, and a heavy oil, of value for lubricating purposes, comes over, leaving behind a black, tarry product. This heavy oil, when cooled down to 30° F., often yields paraffine in large quantities, which is separated by pressing and straining. The remaining substance may be used for pavements, or, mixed with grease, to lubricate heavy machinery. Petroleum contains, on an average, 20 per

cent. of light oil, 50 per cent. of burning oil, 22 per cent. of lubricating oil, and 8 per cent. of carbonaceous and tarry residue.

Natural Gas.

Various theories as to the origin of petroleum have been offered, none of which are fully accepted. One important characteristic of it is the existence of a large quantity of gas, which arises with the oil, or in many cases comes off alone, and which is, no doubt, closely connected in origin with petroleum. This gas was not used until after 1880, and its presence was an annoyance, for it occasionally caught fire and burned with a volcanic flame. It was afterwards carried by pipes to Pittsburg and other places, and became the favorite fuel for manufacturing and domestic purposes. At one time Pittsburg consumed 500,000,000 cubic feet daily in 28,000 houses and 900 manufactories, while great quantities were found in wells at several points in Ohio and Indiana and piped to neighboring cities. But the supply is rapidly diminishing, and coal, for a time largely banished, is again resuming its sway.

Asphaltum and Its Uses.

Petroleum is generally supposed to have originated in organic matter, and the same origin must be ascribed to Asphalt or Asphaltum, a variety of bitumen supposed to arise from the decomposition of vegetable substance. It is found in most parts of the world, is frequently found floating on the surface of springs, and is abundant in the Dead Sea. It occurs very widely in the United States, and there are enormous deposits in Mexico, supposed to have originated in petroleum. Lakes of it exist at San Timolis, in Venezuela, and on the island of Trinidad, each of them being about three miles in circumference. The Trinidad lake is 18 feet deep near the sides and 78 feet in the centre, and is estimated to contain 6,000,000 tons. Large quantities of commercial asphalt are obtained from this lake, and others from Cuba, Dalmatia, Syria, and elsewhere.

Asphaltum occurs as a dry solid, with a glossy black surface and conchoidal fracture. It melts easily, and burns readily, with little residue. It is used in the making of varnish, in water-proofing, and for insulating purposes. Asphaltic cement is of great value in resisting the entrance of water, and is employed in tunnel construction. Large quantities of asphalt are used for roofing purposes, the roofing materials being saturated with a mixture of this substance, coal-tar, pitch, and petroleum. But its most important recent use is for paving. In most of the large cities of civilized lands many miles of asphalt street pavements now exist. In 1890 there were more than 200 miles of such pavements in United States cities, and since then a much greater length has been laid. The city of Washington is very largely paved with this admirable material for light driving use.

How Clay is Utilized.

We have not yet exhausted the important materials which the crust of the earth offers to the use of man. As valuable in their way as any of the metals named are the immense deposits of clay which form the external covering of the rocks in most regions of the earth, and are specially abundant in the river valleys. For building material clay stands first in the history of civilization. During the immense period of 4000 or 5000 years bricks of clay, dried in the sun, formed almost the only building material used in the very ancient kingdoms of Babylonia and Assyria, and similar material, known as adobe, is still in use in Mexico and elsewhere. In later ages burnt bricks came very generally into use, and these are now far the most important of all the building materials used by man, while large quantities of them are consumed in paving, in the building of arches, tunnels, etc., and pipes of burnt clay are indispensable for drainage. In the form of terra-cotta burnt clay is largely used for ornamental architecture, vases, statues, and other purposes. The total value of bricks and other clay products in the United States in 1898 was $58,470,543.

These are far from being the only uses which man makes of this abundant material. At a very remote date he began to mould clay into the form of domestic vessels, kneading it with water, hardening it with fire, and

ornamenting it with simple devices. The making of burnt clay-ware is one of the oldest of the arts, and specimens of broken pottery are found abundantly among the relics of early man. As time went on, the product of the potter grew more elegant in shape and more artistic in decoration, until in ancient Greece it became one of the chief products of the fine arts. The making of pottery has never been suffered to die out. In modern times it is among the most important of the arts. Every family depends largely for domestic comfort on some form of baked clay, now as the rough, strong stone-ware used in pots, jugs, and varied cooking utensils, now as the finer and more delicate ware used in the cups and plates of our tables and other articles of utility.

Manufacture of Porcelain.

From domestic we pass to fine art in the use of porcelain, the richest and most delicate kind of pottery, which is made with the utmost care and skill from the finest and purest clays. This costly and elegant material varies from the semi-transparent and richly ornate table-ware to the highly artistic ornaments of drawing-rooms and museums, in the forms of vases, statuettes, and other products of art, some of which call for the highest skill and rarest genius of the artist. From the rude vessel shaped by primitive man to the nobly artistic vases of many modern art collections there is a vast evolution, yet burnt clay stands at the bottom of it all.

The manufacture of porcelain and other fine wares has become a very important industry of the United States, its chief centres being at Trenton, New Jersey, and East Liverpool, Ohio. The United States possesses inexhaustible beds of the richest kaolin, or porcelain clay, and endless deposits of the commoner pipe, potters' and fire clay, with reservoirs of moist colored clays, and the other materials used in the potter's art. Yet in addition to the vast quantities of pottery made in this country, there is an annual importation of china and earthenware valued in 1899 at $7,600,000.

Not only the clays, but the stones of the earth's crust are employed in useful purposes by man, and from a very early date stone has been used for the most pretentious architecture and the most stupendous erections. From the mighty pyramids and enormous temples of Egypt, and the huge megalithic structures of other ancient lands we come down to the artistic temples of Greece, the charming examples of Saracenic architecture, the ornate Gothic cathedrals of the Middle Ages, and the varied examples of religious and public architecture of our own times. Aside from these grander structures are multitudes of dwellings in which stone replaces brick.

Common Building Stones.

Far the most common of building stones are the sandstones and limestones, while granite is used to a considerable extent. Sandstone of fine brown and reddish shades of color is exceedingly abundant, and is very widely employed for the more pretentious mansions, while limestone, both in its finest form of marble, and in its non-crystalline but strong and hard varieties, is a favorite material for churches, banks, and other public buildings. For interior decoration the many richly-colored marbles are of unsurpassed beauty. The use of granites is also considerable, and there are various other building stones more rarely employed.

The United States abounds in excellent building stones. Sandstones are widely distributed, have much variety of tint and texture, and are comparatively cheap, so that, aside from brick, they form the most valuable group of American building materials. Building granites are chiefly obtained from the quarries of Maine. They vary in color, the Calais stone being red, the Spruce Head variety gray, and that from Hallowell nearly as white as marble. All the other New England States, and some other States of the Union, contain granite suitable for building purposes, and of late years polished granite has come largely into use for house columns and cemetery ornament.

Marbles of fine character are also abundant, the strong and durable white marble from Lee, Massachusetts, being that used in the Capitol at Washington and the Philadelphia City Hall, the largest public edifices in America. Rutland County, Vermont, is the centre of the marble industry for purely

decorative purposes, though of late years colored marbles of great beauty have been found in many parts of the United States. Fine statuary marble has also been found in this country, though for ages past Italy has been the chief source of supply to sculptors. The famous old quarries of Carrara are still rich in the finest marbles, of which they supply from 40,000 to 50,000 tons per annum. The total production of building stone in the United States is estimated at a value of $30,000,000 yearly.

Mineral Production.

The total value of all the minerals produced in the United States in the calendar year 1899 was $876,008,946, a product 40 per cent. greater than that of 1889, the figure for which was $697,820,790. The greatest increase in 1899 was in the value of the pig-iron product, which increased to $245,172,654, or about 110 per cent. over 1898. The enormous increase was due to the phenomenal demand and high prices. The increase in coal production added over $48,000,000, or 23 per cent. to the 1898 value. Copper increased nearly 60,000,000 pounds in quantity and over $42,000,000 in value, the ruling prices being higher than for several preceding years.

Crude petroleum advanced nearly $20,500,000, or about 45 per cent., due principally to advanced prices, the production increasing less than 4 per cent. The value of the natural gas consumed in 1899 was placed at a little over $20,000,000, against 15,300,000 in 1898, due entirely to the higher prices charged.

An increase of about 10 per cent., or from $64,463,000 in 1898 to $71,055,400 in 1899 was shown in gold production. The production of silver showed a small increase. Lead production decreased 6 per cent., but increased over $2,000,000 in value. Zinc increased to 119,408 short tons, valued at $13,731,920. The building stone industry increased nearly $8,000,000. Every year from 1881 to 1898, inclusive, the value of the non-metallic products exceeded the metallic, but in 1899 the metallic was greater by $79,500,000. A change of nearly $90,000,000 occurred in the relative values between 1898 and 1899.

The Deepest Mines.

In connection with the subjects treated in this chapter the following facts may be of interest.

The most extensive mines in the world are those of Freyburg, Saxony. They were begun in the twelfth century, and in 1835 the galleries, taken collectively, had reached the unprecedented length of 123 miles. A new gallery, begun in 1838, had reached a length of eight miles at the time of the census of 1878.

The deepest perpendicular mining shaft in the world is located at Prizilram, Bohemia. It is a lead-mine which was begun in 1832. In January, 1880, it was 3,280 feet deep.

The deepest coal mine in the world is near Touney, Belgium; it is 3,542 feet in depth, but, unlike the lead-mine mentioned above, it is not perpendicular.

The deepest rock salt bore in the world is near Berlin, Prussia, its depth being 4,185 feet.

The deepest hole ever bored into the earth is the artesian-well at Pottsdam, which is 5,500 feet deep.

The deepest coal mines in England are the Dunkirk collieries of Lancashire, which are 2,824 feet in depth.

SCIENCE IN ELECTRICITY

We are in the midst of the Age of Electricity. A hundred years ago electricity was a toy; people amused themselves with drawing sparks and giving shocks. To-day, it is the leading power of the world. It is around us on every side. We travel by its aid; it carries our news at lightning speed; it talks for us across the continent; it lights our cities and warms our houses: it does twenty services besides, and as yet it is only in its infancy, no one can say what wonders it reserves for us. This being the case, every one should know something of this wonderful force and its performances. They should know what electricity is and what it does, so far as any one can tell them. Of

what it is we know very little. Of what it does we know more. It is proposed in the present chapter to tell the story of this magical force, and state what have been its developments within the recent century.

The Nature of Electricity.

What is electricity? This is a question much more easily asked than answered, unless we adopt the brief and decisive answer of the agnostic, "Nobody knows." For a long time it was supposed to be a substance. Some thought it to be two substances, one attracting the other. At a later date scientists began to look upon it as a motion, an extraordinary rapid agitation of the fine particles of matter. The force of electricity was regarded as the energy developed by this motion. Since we have learned that electricity can travel along the telegraph wire at the speed of many thousands of miles in a second, and reach San Francisco from New York while we are drawing a breath, we feel sure that it is a motion, for no one dreams of matter travelling at so vast a speed.

If it be asked, What kind of a motion is it? the answer is that it is thought to be a wave motion, closely similar to that of light. This is the theory of Mr. Clerk-Maxwell, a Scottish scientist, who found that electricity travels as fast as light. Since then it has been learned that electricity can be reflected and refracted like light, and investigators now feel sure that these two forces are very close relations—either sisters or first cousins. There is one marked difference; light journeys freely in straight lines, through open space; electricity is confined to the surface of matter, from which it cannot escape, and it can be made to follow very crooked lines, along curved and twisted wires.

Electricity is a Force.

Scientists are now satisfied about some other things. At one time it was thought that matter extended in a very rare form through all space, and that light was a vibration of this diffused matter. It is now believed that space is filled with an extremely delicate substance, very much finer than ordinary matter, which has been given the name of ether, and that light is a motion of this wonderfully fine material. If electricity is like light, it also must travel through ether, and we are now taught that the electric current does not really pass along the surface of the telegraph wire or other conductors, but through the ether which surrounds and touches this surface. It is held that matter is too coarse for wave motion to pass through it with any great speed, and that the vast rapidity of the light and electric waves needs some far finer vehicle. All this goes to indicate that science has learned a little about the general character of electricity, even though it does not know its special nature and conditions. What we are principally concerned here with is the fact that electricity is a force. It is set in action by some power, mechanical or chemical, and when it has completed its journey, long or short, it displays a power similar to that which set it going, though not equal, for some of it is lost in the journey.

Magnetic Attraction.

Now let us turn our attention to Magnetism, another of the wonderful powers of nature. It is very different in character from electricity, which it resembles only in one thing, that both possess the power of attraction and repulsion. Yet like many unlike people these two are good friends, and work together in harmony. In fact, if it were not for magnetism, all the wonderful power of electricity would be of little use to us. Without the magnet we could get no rapid news by telegraph, and the trolley car would stand still upon its track; so that the modern world is as greatly indebted to the magnet as it is to the electric current.

We have said something about the nature of electricity; now let us say something about the nature of magnetism. Very likely all of you have read the story of how Sir Isaac Newton saw an apple fall from a tree and began to think about what made things fall downwards instead of upwards or sideways. He came to the conclusion that there is some principle in matter that makes it draw all other matter towards it, a power which is known as attraction. All things in the air are drawn downward to the earth

because the earth is a great mass of matter, and has a very powerful attraction. But the earth itself tends to fall towards the much larger sun, and all the suns of space are pulling steadily upon one another. It is only their rapid motion in other directions that keeps them from all tumbling together and forming one monstrous central sun, as large almost as a universe. This wonderful force is called gravitation, or universal attraction.

But wait a moment. Let us see if this is the whole story. Take in your hand a piece of iron that has been treated in a certain way and hold it over some iron nails or other small bits of iron. You will quickly see that all things do not fall downwards, for the nails will at once fall upwards and cling to the end of the piece of iron. Here is a wonderful mystery; this iron bar or horseshoe has in it an attraction for small things greater than the attraction of the earth. We call this piece of iron a magnet, but that is only giving it a name. What magnetism is we do not know.

This much we do know, that the magnetic force does not belong to the iron. We can give magnetism to a piece of iron, and can take it away again. By rubbing it in a certain way with a magnet we can make it attract other iron. By rubbing it in the opposite direction we can deprive it of this power. We judge from this that magnetism also is a motion, not a substance. But it is not a traveling motion, like light and electricity. It is a local motion, a motion inherent in the particles of matter. In most substances the magnetic attraction is very slight. It is usually so in iron and nickel, but under certain circumstances the particles or molecules of these metals all seem to pull together and exert a strong attraction.

Magnetic Repulsion.

This is not the whole mystery of the magnet. It has another force, known as repulsion. If we take two magnets and hold two ends of them near each other, we feel a strong pull, a powerful desire to come together. But if we turn one of them so that its other end comes into play, we feel a push instead of a pull. Instead of attraction there is repulsion; they are seeking to push each other apart. Thus the two ends of the magnet exhibit different powers, and seem to possess opposite properties. To distinguish them we call one end the north pole (because, for some strange reason, it is attracted towards the north pole of the earth), and the other end the south pole (it being attracted towards the south pole of the earth). The principle of the magnet is that two north poles or two south poles repel each other, while a north and a south pole attract each other. What is the cause of all this no one can very well say, but the strange fact exists that a piece of iron can manifest three conditions, attracting under one condition, repelling under another, and under a third neither attracting nor repelling.

The Electro-Magnet.

There is another and highly important magnetic property of iron yet to be described. There is a difference between soft iron, which has been deprived of its carbon, and steel, or carbonized iron. Soft iron can be made as magnetic as steel, but does not retain its magnetism. Steel accepts magnetism slowly, but retains it indefinitely. And a close relation between electricity and magnetism is shown in the fact that the easiest and quickest way to make a magnet is by aid of the electric current. If a wire be wound in many turns around a piece of soft iron and a current of electricity be sent through it, the iron instantly becomes a magnet, and attracts any iron that is near it. If the current be cut off, the iron instantly loses its magnetism, and at once lets fall the iron it held, or ceases to attract the iron in its vicinity. Furthermore, if wire be curved into a spiral or solenoid and an electric current sent through it, the solenoid itself acts as a magnet. This fact, that electricity moving round a spiral acts as a magnet is very strong evidence that magnetism is a phenomenon due to motion in curves or circles; but beyond that we know very little about it.

Soft Iron Magnet.

A piece of soft iron thus magnetized is known as an electro-magnet. And an electro-magnet is one of the most valuable things that man is acquainted with. Its

value lies in the quickness with which it gains and loses magnetism, for this is the principle employed in the electric telegraph and the electric motor. If the electro-magnet gained and lost its strange power slowly instead of instantaneously, we could still send messages by telegraph, but we might get less news in a day than we now get in five minutes. As for the electric motor, it would be useless under such conditions. So we can thank mother Nature that soft iron has this wonderful property and does not let go of its magnetism slowly or hold on to it permanently like steel.

One thing more may be said about the theories of magnetism. It is now thought that every molecule of matter is a magnet, being possessed of a peculiar motion that gives it this strange property. But usually each molecule seems to act independently, and the many small attractions and repulsions conflict with and neutralize each other. It is difficult to make them act together, or exert their powers all in the same direction. This is easily done only in the cases of iron and nickel, the two magnetic metals. The molecules of soft iron are supposed to yield readily to the coercive force of the electric current, turn so as to pull all together, and turn back as soon as the coercive force ceases. The molecules of steel yield less readily, but when they are once brought to act in harmony they retain this relation, and the bar of steel becomes a permanent magnet. The carbon in the steel very probably has something to do with this difference.

Electro-magnetism is one of the most important, if not quite the most important, discoveries of modern times, and before going into an account of its many useful applications it seemed desirable to state briefly what electricity and magnetism are, and to what properties their great utility to man is due. To describe them scientifically would need a volume, so we must be content with this very brief statement of their inherent characteristics before going into the story of their various applications.

History of the Telegraph.

From the earliest time, when beacons lighted on the tops of the hills were used to indicate the approach of an enemy, or the occurrence of some other important event, the power of communication at a distance has been felt to be a desideratum. Many inventions and arrangements have from time to time been made with this object, as, for example, the signals by flags, or by the old semaphore system—which is still employed for railway signalling—by ringing of bells, or by the motion of water in tubes, but none of these was applicable to any but short distances, or indeed generally applicable at all. One common method used in former times was by columns of smoke or fire; and the heliograph flashing of signals from hill to hill by mirrors and sunlight is still in use. The discovery of the conduction of electricity along metal wires, however, soon gave rise to the idea of communicating signals by means of its effects, and the electric telegraph has now become one of the most powerful agents for the promotion of civilization, and even a necessity of every-day life.

The first electric telegraphs proposed were founded on the observation of motions produced by the attractions and repulsion of statically electrified bodies. In 1747 Watson showed the transmission of a discharge from a Leyden jar through a wire stretched across the Thames; and later in the same year he caused it to pass through 10,600 feet of wire supported on insulators, which were attached to wooden posts. The first effort to convey intelligence by means of electricity was made in 1774, before the discovery of the galvanic battery and the electro-magnet. It was proposed to have a separate wire for every letter, each wire to be connected at one end with an electric machine and at the other end with an pithball electroscope. At a later date a man named Dyer, of New York, devised a scheme of telegraphing with a single wire. As the galvanic battery was not then known, the frictional machine was to be used, while the message was to be given by a point passing over litmus paper, which the current was to mark by chemical action.

But practical telegraphy waited until after the discovery by Galvani of the electric battery and current and by Oersted of the effect of the current upon a magnetized needle. The fact that the current could

cause motion in such a needle led to many schemes of telegraphing, of which the only one that has held its own is the Wheatstone method in which deflections of the magnetic needle indicate the letters of the alphabet. This is still employed on the railways of England.

Morse and his Invention.

The electric telegraph now generally in use employs a different principle. In the year 1832, an American artist named Samuel F. B. Morse was on his way home from France in the packet-ship *Sully*. During the voyage a conversation took place in the cabin about some experiments that had been made just before in Paris, in which signals were transmitted over a considerable length of wire. This set Morse to thinking. If signals could be made through hundreds of feet of wire, why not through hundreds of miles? During the remainder of the voyage he sought to devise some practical method of signalling over the electric wire, and on reaching New York he began a series of experiments which lasted for years. His studio was abandoned, his pocket was often empty, and more than once he went hungry in his devotion to his idea. No one would put money in it, he was looked upon as a crank, and it took him eight years to get Congress to make a small appropriation of $30,000 for the construction of an experimental line between Washington and Baltimore.

Even then Morse's difficulties were far from at an end. He spent nearly all the money in trying to lay the wires underground. Ezra Cornell—to whom we owe Cornell University—came to his aid with an ingenious excavating machine which dug a ditch for the pipe that held the wires and filled in the earth behind it. But as they went on the current grew steadily weaker, and after ten miles were laid it failed altogether. Experiments were made, and time passed on, and nearly all the money was gone, but still the wires refused to carry the current. Then some one suggested that they should be strung overhead instead of laid underground, poles were rapidly erected, the wires were stretched across their tops, and now the current responded splendidly. Soon the wire was extended from Baltimore to Washington, and on one notable day, in 1844, the famous first message, "What hath God wrought," was sent over its full length, teaching the legislators at the National Capital that a new wonder had come into the world.

It is said that the original method devised by Morse was a very complicated series of signals, which needed a telegraphic dictionary to make out their meaning, and that the "dot and dash" system, known as the Morse alphabet, was really the invention of Alfred Vail, his partner. Also that the use of a single wire and the familiar telegraph "sounder" were due to Vail. However that be, the honor of the invention fairly belongs to Morse, and the world has been glad to give it to him, while the name of Vail has vanished into obscurity.

The Morse telegraph is properly termed an electro-magnetic telegraph. In it the electro-magnet is employed as an essential feature. It is the rapid magnetization and demagnetization of soft iron, with the successive attraction and release of the sounder, that convey to the ear the dots and dashes of the alphabet. At first it was thought necessary to trace these on a revolving roll of paper, for subsequent reading, but this was soon discarded as useless, and since then sound-reading alone has been practiced.

The Morse Alphabet.

In the Morse receiver the instrument consists essentially of a soft iron bar surrounded by a coil of wire, and a lever of soft iron below the bar, which acts as an armature. When the current passes through the wire the bar becomes a magnet and attracts the armature, which springs upward with a sharp click against a stop-screw. When the current is stopped the bar loses its magnetism and the armature is drawn quickly down by a spring. It is not the sounds, but the spaces or rests between the sounds, that form the signals. A short space is known as a dot, a long space as a dash, and each letter in the telegraph alphabet is made up of a combination of dots and dashes. This alphabet is an exceedingly convenient one, as it can be employed in other ways than on the telegraph. It can be made with a locomotive whistle, a horn, a light, a heliographic flash.

and in other ways. We give the alphabet below. As will be seen, no letter contains more than four signals, while the numerals employ five signals each.

A - —	J - — — —	S - - -
B — - - -	K — - —	T —
C — - — -	L - — - -	U - - —
D — - -	M — —	V - - - —
E -	N — -	W - — —
F - - — -	O — — —	X — - - —
G — — -	P - — — -	Y — - — —
H - - - -	Q — — - —	Z — — - -
I - -	R - — -	

Numerals.

1	4	7
- — — — —	- - - - —	— — - - -
2	5	8
- - — — —	- - - - -	— — — - -
3	6	9
- - - — —	— - - - -	— — — — -
	o	
	— — — — —	

On applying the Morse instrument to a long line, it was found that the current was frequently so weak that it could not move the armature, hence Morse connected with the instrument a *relay* and *local battery*. The relay consists of a pair of electro-magnet coils through which the line-current passes. The only work that these coils require to do is to draw down a light armature, and the motion of this armature, by means of a lever, closes a local circuit containing a battery and the Morse instrument. Thus on every passage of the current through the line-wire, a current is caused to flow from a local battery through the instrument, and the work required to be done by the line-current is very small indeed, being merely the motion of the key of the local circuit at the receiving end.

The Wheatstone Telegraph.

The Wheatstone system, in use on the English railways, is very different. In this a needle replaces the sounder. At first five needles were used, each worked by two wires, but now one needle and a single wire do the work. When no current is passing the needle stands upright on a dial, but the current causes it to swing to the right or left. Even this system has been invaded by the Morse alphabet, which is in use all over the world. In the needle system a swing to the left means a dot and a swing to the right a dash. These form the frequently used letters E and T, while a combination of swings forms each of the other letters.

It need hardly be said that the electric telegraph system made remarkable progress. The first business telegraph in the United States, from New York to Washington, was completed in 1845, the first in England was founded in 1846. In 1870, when the English Government bought all the telegraph lines, at a price of about $50,000,000, there were in the British Islands 60,000 miles of wire. In 1890 there were 195,261 miles. The United States in 1890 had 210,000 miles of line and 678,997 miles of wire. In 1899 the Western Union Telegraph Company had 189,856 miles of line and 904,633 miles of wire, while the Postal Telegraph Cable Company also did business, but kept its length of wire a secret. The British Islands send the largest number of messages of any nation, 78,800,000; the United States stands second with 70,000,000.

The Ocean Cables.

The land telegraph was not many years old before efforts to telegraph under water were made. It was found that the current could be sent for short distances beneath rivers, and in 1850 the first ocean telegraph was laid across the English Channel, by two men named Brett. This was a single copper wire covered with gutta percha. Soon there were others under different short bodies of water, but no one then deemed it possible to carry a wire across the Atlantic, then thought to be of fathomless depth. But in 1853 an important discovery was made. The bottom of the Atlantic was sounded from Newfoundland to Ireland, and there was found a vast plain, nowhere more than two miles deep, while it was 1600 miles long and 400 wide.

This discovery set men to thinking that an ocean cable was possible, and chief among these was Cyrus W. Field, a New York merchant, who had already built a telegraph line across Newfoundland. He went to work with remarkable energy, organized a company, and by November, 1856, had a capital of more than $1,000,000 subscribed. A cable was made in England,

loaded on the American ship *Niagara* and the English ship *Agamemnon*, and in August, 1857, the *Niagara* set out from the Irish coast. But the cable broke, other accidents happened, and the task had to be given up. The next year it was tried in a different way. The two ships met in mid-ocean, joined their wires, and steamed away. Once more the cable parted, and hope was lost, except by Cyrus W. Field, who was one of the kind of men who do not give up. In July the vessels met again, spliced together their cables, and once more steamed east and west, telegraphing to each other through the wire as they went. This time the cable held, and on August 29, 1858, for the first time in the world's history, men spoke to each other across the wide Atlantic. The Queen saluted America, the President sent greetings to England, cannon roared, bells rang, bonfires blazed; but day by day the messages grew weaker, and finally ceased—the cable had failed.

The Great Eastern.

Seven years followed, a great war was fought in the United States, many scientists declared that an ocean cable was the fancy of a dreamer, and some even denied that any messages had crossed the Atlantic at all; but Field did not despair. New cash was raised, a new cable was made, and in 1865 the *Great Eastern*, the largest vessel on the seas, set out from the Irish coast, rapidly dropping the leagues of wire into the sea. On August 9th a flaw occurred; the cable was drawn up for repairs; suddenly the sound of the wheel stopped; the cable had broken and sunk helplessly into the depths. But "never despair" was Field's motto, and once again, in July, 1866, the *Great Eastern* set out laden deep with ocean cable. On July 26th she steamed into Trinity Bay, Newfoundland, landed her cable at Heart's Content, and her grand work was accomplished. The cable was successfully laid, and from that date to the present, time and space have been banished in the sending of news between Europe and America. The lost cable of 1865 was soon after lifted from the ocean bottom, spliced, and proved in good condition. Two cables crossed the ocean.

Since then the laying of ocean cables has been an almost yearly event. To-day more than a dozen cables cross the Atlantic to Canada and the United States and others to South America, while many parts of Africa, Asia, and the Pacific islands are connected by cable with the centres of civilization, so that the whole world is brought within speaking distance. The oceanic and coastwise cables in 1900 numbered 323, with a total length of 151,067 miles, and daily news reached New York from China, Manila, Australia, and a thousand other distant points.

The Cable and Its Instrument.

The ocean cable is a very different affair from the simple land wire. Strength and complete insulation are needed. The 1865 cable consisted of a central copper wire, with six others twisted spirally around it, the whole being thickly treated with a mixture of tar, resin, and gutta-percha. Over this were laid four coatings of this compound and of pure gutta-percha, then a wrapping of jute, and an outer sheath of ten iron wires, each of which was thoroughly wrapped with strands of tarred Manila rope. The total thickness was about 1¼ inches, the weight 36 cwt. per knot. In later cables many improvements have been adopted, but they vary so much that we cannot attempt to describe them.

The making and laying of the cable was not the only thing necessary. The reader will remember Professor Morse's failure in laying his first wire under ground. This was due to what is known as Induction, a checking influence exercised by the earth on the wire. In the long Atlantic cable induction became a powerful resisting agent, the currents followed each other slowly, and so little electricity got through that the ordinary sounder was not available. A far more delicate receiving instrument was needed. A very sensitive one was invented by Sir William Thomson (now Lord Kelvin), without which the cable could not have been successfully worked for commercial purposes. This consists of a magnet made of a fragment of watch-spring, ⅜-inch in length, cemented upon a small circular convex mirror of silvered glass, which is suspended

by a short thread of cocoon silk. Around this minute magnet is a coil of very fine wire, and a ray of light from a lamp falls on the mirror. This ray is reflected upon a scale at such a distance that a very slight movement of the mirror makes a considerable movement of the spot of light upon the scale. These movements are read off like those of a Wheatstone needle. With the Morse sounder less than a word a minute could be received over an Atlantic cable, while the reflecting instrument gives easily fifteen words a minute, and as many as twenty-four have been received. In 1869 Thomson invented the Syphon Recorder, by which cable messages could be permanently recorded.

Overhead and Underground Lines

Telegraph lines may be either overhead or underground. The former system is used wherever possible, but in large cities many miles of underground wire have been laid. Of the 2,600 wires which enter the Central Telegraph office in London, nearly all are underground. Overhead wires are supported upon wooden (sometimes upon iron) poles, by means of insulators made of glass, porcelain, or other material through which the current cannot pass. The wire used is either galvanized (zinc-coated) iron wire, or hard-drawn copper wire for special purposes. Underground wires are laid in pipes or boxes and carefully insulated, there being flush boxes at intervals through which the wires can be reached for repairs or testing. The batteries usually employed in telegraphy are Daniell's sulphate of copper battery, the bichromate of potassium battery, and several others.

Duplex and Multiplex Telegraphy.

The first great invention in the cheapening of telegraphy was the duplex system, by which two messages could be sent at once in opposite directions over a single wire. This is done by a method of dividing the current, an ingenious arrangement of wires enabling each operator to use a special portion of the current. This system was developed by the genius of Thomas A. Edison, in 1874, into one in which two messages could be sent at once in each direction, thus constituting a fourfold or quadruplex system.

A still more remarkable invention is multiplex telegraphy, by which a considerable number of messages can be sent at once without interference over a single wire. The principle involved is to have at each end an apparatus on which rotating arms move synchronously, or in exact correspondence. When the synchronism is exact, a message sent over one arm can be received only by the corresponding one, and if there be a number of such arrangements set differently, each can be worked separately without interference with the others. This system, first suggested by Meyer in 1873, was perfected and made practical by Patrick B. Delany, of New York, in 1884, and by it the working capacity of a single wire was enormously increased.

The Art of Electrical Communication.

The state of the art of electrical communication to-day may be summed up as follows:

Telephony	60 words a minute
Single Morse circuits	15 words a minute
Duplex Morse circuits	30 words a minute
Quadruplex Morse circuits	50 words a minute
Multiplex (six circuits)	80 words a minute
Wheatstone automatic	125 words a minute
Wheatstone automatic duplex	200 words a minute
Wireless	10 words a minute

Undoubtedly before the new century is ten years old at least one-half of the correspondence now carried by train will be telegraphed, at an average rate for the whole country of 15 cents for fifty words, or five times as many words for one-half the present telegraph toll. It is practicable to begin this change at once, but not by present methods of operation. It is only possible by the chemical automatic system.

What the centenarian of a hundred years hence may see, a prophet should leave to his son to prophesy. In the way of telegraphy, doubtless ships at sea will hold converse with each other, and correct their chronometers with the last observation a hundred miles away. They will be in constant communication with the shore through the air, though the trip from the Hook to the Lizard may then be made so rapidly that only the overanxious will want a dispatch.

Printing and Automatic Telegraphs.

Various other inventions have helped to perfect telegraphy. An important one of these is the Hughes Type-printer. In this the sender is like a piano keyboard, with the letters engraved upon the keys, and the message is received in plain printed characters. But the mechanism is so complex and sensitive that only the most skillful operators can handle it. There are several other printing systems in use.

In all the apparatus described the message must be sent by hand, and even by the sounder, the fastest hand instrument known, the most expert operator cannot send more than forty-five words per minute. But the electric current is capable of performing far more rapid work than this, and there are a number of automatic systems in use that can be operated with extraordinary speed. But it is necessary to prepare a paper transmitter in which the message is punched with holes representing letters, and the time and cost of preparing this is the defect of the system. When ready it can be run through the machine at a speed of over 400 words per minute. But this is very slow as compared with a system credited to two Hungarian engineers, Pollak and Virag, in the year 1899. Their system employs as receiver a reflecting mirror, like that used in cable telegraphy. The beam of light, swinging to right and left, falls on a sensitive slip of photographic paper moved by clock-work, and is thus recorded. There is claimed for this instrument a speed of about 1600 words a minute. But, as in all automatic systems, the time gained in sending is lost in preparing and translating, and the old-fashioned Morse sounder does not seem likely soon to be banished.

Wireless Telegraphy.

It is no new fact that telegraph messages can be sent without the aid of wires. Prof. Morse sent messages across a small river, having batteries on one side and magnets on the other, and wires on each side parallel to each other and connected with buried copper plates. By a similar process in 1893 messages were sent a distance of three miles, and later for four and one-half miles. In these experiments the principle of electric induction was used. In 1895 the powerful Hertzian waves were employed, in which the electricity seems to stream out like a fluid through miles of air. In 1896 Marconi, an Italian electrician, invented a method in which he found that these waves spread out in all directions, and would act on receiving instruments placed all around at a considerable distance away. His first messages were sent about a mile, but since then he has sent them across the English Channel, and for many miles in other localities. What the end of this new and wonderful process will be it is too soon to predict, but it is likely to prove useful in a hundred ways in the coming time.

The Discovery of the Telephone.

Wonderful as is the telegraph, with its power of transmitting instantaneous sound signals over thousands of miles of distance, still more wonderful is a later discovery—the telephone,—by which the very tones of the human voice are similarly transmitted. The first discovery in this direction was made in 1861 by Johann Philipp Reiss, a German professor, of Friedrichsdorf, who exhibited his telephone at Frankfort on April 25th of that year. His discovery embraced all the essential features of the existing telephone, but he sought in vain to induce scientists to pay attention to it, and he died in 1874 a victim of disappointment and distress of mind. But his idea was not lost. Others took it up and developed it into a more practical system. Chief among these were Elisha Gray, of Chicago, and Alexander Graham Bell, of Boston, both of whom entered their discoveries at the patent office on the same day. On February 14, 1876, Professor Gray filed a caveat of his invention and Professor Bell applied for a patent on his. Bell gained the priority, a fact worth millions of dollars to the inventor. The Bell telephone, which was first exhibited in a retired corner of the Centennial Exposition at Philadelphia in 1876, has now its hundreds of thousands of miles of wire in the United States. Among the others who aided to perfect the telephone may be named Prof. C. E. Dolbear, of Tuft's College, Massachusetts, and Thomas A. Edison.

In regard to the question of priority, it is generally conceded that Prof. Gray was much in advance of others with successful experiments, but Prof. Bell was the first to perfect his invention and secure a full patent. On February 12, 1877, his telephone was tested between Boston and Salem, and found to convey vocal sounds from one place to the other, a distance of eighteen miles. Edison's carbon "loud-speaking" telephone was brought out in 1878, and proved of inestimable value. Since then, there have been many improvements in the different parts of the telephone, and it has become a daily feat to carry on a conversation between New York and Chicago, nearly 1,000 miles away.

The Principle of the Telephone.

It need hardly be said that the sensation we call sound is due to the action of the vibrations of the atmosphere upon the tympanum or drum of the ear. a thin stretched membrane. The telephone employs a kind of artificial ear, consisting of a stretched membrane, which is repeated at each end of the wire, one accepting the sound, the other reproducing it. The voice of the speaker falling on the receiving membrane, causes it to vibrate in the same manner as the drum of the ear. The effect of the vibrations is to cause a rapid making and breaking of an electric current which traverses a telegraphic wire, and these electric waves in turn act upon a diaphragm or tense membrane at the receiving end, causing it to vibrate in the same manner. The sounds which caused the first vibration are imitated by the second and fall upon the ear of the listener as vocal utterances.

This instrument at first was very imperfect. The most that Reiss could do was to reproduce the pitch of the vocal tones. Gray succeeded in producing their intensity also. Edison added an important principle. He discovered that carbon possesses the valuable property of changing its resistance to the electric current with every variation in pressure. Thus, instead of an incessant making and breaking of the current, as in the old method, in his system the current simply varies in intensity. The membrane vibrates against a disk of carbon, every vibration modifying the pressure and therefore changing the strength of the current. As a result the membrane of the receiver repeats all the fine shades of vibration in that of the transmitter, and the voice is reproduced with all its individual characteristics. Instead of hearing mere lifeless sounds, one can now easily recognize the speaker—by the tones of his voice. The microphone, the discovery of which was claimed by both Edison and Berliner, is the basis of the carbon telephone, since in it the principle of carbon pressure was first employed. It is also employed as a relay in receiving telephones, its advantage resting in its power of magnifying faint sounds. In the microphone a loose piece of carbon touches another in a telephone circuit, the jarring of the loose carbon causing a rapid variation of pressure and electric current, and magnifying the original sound. When it was first introduced, experiments were made in which the sounds of a fly's feet in walking could be very distinctly heard.

The Telephone Receiver.

It need scarcely be said that the carbon disk cannot be made available at the receiving end of the telephone, and that a different apparatus is necessary to cause the requisite vibration at this end of the circuit.

This apparatus consists of a small electro magnet in connection with a thin disk of iron, fastened at its edges and free to vibrate at its centre. Every variation in the strength of the current reduces or increases the attractive power of the magnet and thus varies the influence exerted upon the diaphragm, causing it to vibrate in close sympathy with the vibrations of the transmitter, the sounds of the voice being thus very closely reproduced. It must be borne in mind that the sounds are not actually carried, but are reproduced by the rattle of a thin piece of iron close to the listener's ear, whose effect is to give the vocal tones in close exactness. The volume of the speaker's voice is not reproduced. That has so far proved impossible. The sounds received are much lower, yet quite clear and distinct when the receiving instrument is held close to the listener's ear.

Development of the Telephone Service.

In the United States the American Bell Telephone Company gained an early monopoly of the telephone service by buying up all competing patents of importance. The first patents began to run out in 1893, but there remained patents on switch-boards and other accessories necessary to the business, and the Bell corporation still holds control. One important invention of recent date does away with the necessity of calling up the central office and announcing the number of the transmitter. Now, as soon as the instrument is taken from its hook, a visible signal on the corresponding section of the switch-board reveals the fact and number, and it is only necessary to state the number with which connection is desired. This, if the number is not already in use, is at once made by the active assistants at the central office, and the two persons who wish to hold a conversation are placed in direct communication, though many miles of space may separate them.

The telephone has marked advantages over the telegraph, arising from the fact that an intermediate operator, often at a considerable distance, is not necessary. Each subscriber has his individual wire, entering his office or house, and the instruments for sending and receiving no longer need to be shut up in a corner closet, but may stand on his desk at his elbow, to be picked up and used as often as needed. Thus a man sitting in his office or a woman in her parlor may in an hour's time carry on brief conversations on social or business matters with persons many miles distant in various directions who otherwise could be communicated with only by dint of much time and many journeys or by the slow method of the mail. As a time-saver the telephone stands first among modern discoveries, and without its aid the present activity of business would receive a serious check.

Long Distance Telephone.

Long distance telephony was first begun in the United States in 1883, in which year a line was operated with success between New York and Cleveland, Ohio. The conducting power was greatly increased by the use of a large copper wire, and the difficulty due to imperfect insulation was gradually overcome, so that the voice could be heard with distinctness for that distance. In 1892 New York and Chicago 930 miles apart, were successfully connected, and this line was afterwards connected with the Boston line, making a distance of 1259 miles. Almost all the large cities of the United States are now connected by long distance telephones, as are also the leading cities of Europe. It is perhaps but a question of time when the voice of man will be heard from America to Europe under the broad Atlantic.

Telephone Statistics.

The following are the latest statistics made public by the American Bell Telephone Company, which practically monopolizes the telephone business of the United States. The figures are for January 1st, of each year:

TABLE SHOWING THE GROWTH OF TELEPHONE SERVICE:

	1897.	1898.	1899.	1900.		1897.	1898.	1899.	1900.
Exchanges	967	1,025	1,126	1,239	Miles wire submre	2,818	2,675	2,973	3,404
Branch offices	832	937	1,008	1,187	Total miles of wire	536,845	626,400	772,989	1,016,776
Miles of wire on poles	286,632	327,315	396,503	509,036	Total circuits	264,645	295 904	338,293	422,620
Miles of wire on bld'gs	12,594	13,776	15,329	15,087	Total employés	14,425	16,682	19,668	25,741
Miles of wire underg'd	234,801	282,634	358,184	489,250	Total stations	325,244	384,230	465,180	632,946

The number of instruments in the hands of licensees under rental at the beginning of 1900 was 1,580,101. The number of exchange connections daily in the United States is 5,173,863, or a total per year of over 1,666,000,000. The average number of daily calls per subscriber was 8 2-10. The capital of the company is $25,886,300.

The long-distance company had January 1, 1900, 12,006 miles of pole line and cable, and 150,380 miles of wire connecting 323 offices.

On January 1, 1898, Germany had 173,981 telephone stations; Sweden and Norway, 52,930; France, 45,000; Russia, 20,108; all Continental Europe, 465,180; Great Britain (1899) 103,684; United States (1900), 632,946.

As will be perceived, the United States has made far the most rapid progress in telephony, its number of stations equalling that of the whole Continent of Europe.

The Phonograph.

The investigations into the telephonic principle led to another discovery, in its way still more wonderful, though as yet of less practical utility, made by Mr. Edison in 1877 and announced to the public in the following year. This was the seemingly magical Phonograph, in which the voice is not sent over a wire, but is sealed up in a casket, to be released for the benefit of future audiences. By its aid the voice of the orator or singer of to-day may be heard in all its varied tones and inflections ten or twenty centuries hence, ages after the very existence of the speaker or singer may have been forgotten.

The principle of the phonograph is a simple one, wonderful as are its results. Though due to studies in electrical phenomena, electricity has nothing to do with it, it being merely a method of producing vibrations in a tense diaphragm, as in the telephone, and causing those vibrations to permanently record themselves. In the phonograph a small brass cylinder is caused to turn on a metal shaft, and arranged to travel horizontally on a spiral thread cut in the shaft. On the surface of the cylinder is stretched a sheet of tinfoil, and in front of it is a mouthpiece, with a very thin metal plate or diaphragm at its bottom, to which is attached a round steel point. This point touches the foil, and when the diaphragm is made to vibrate by words spoken into the mouthpiece it is pressed into and scratches the foil. By turning a crank attached to the shaft, the cylinder is caused to rotate and move horizontally, and as words are spoken into the mouthpiece the sharp steel point makes a spiral series of indentations in the foil, of varying depth and character, in accordance with the strength and rapidity of the vibrations produced.

If now the cylinder be brought back to its starting point and a resonator be put in the place of the mouthpiece, the words and tones of the voice can be closely reproduced. The steel point is held by a screw against the foil, and as the cylinder rotates the point retraces the indentations from end to end, causing the diaphragm to vibrate in the same manner as before, and producing similar vibrations in the air. These vibrations from the resonator sound like spoken words, and if the crank be turned exactly as originally, the exact pitch and tone of the voice will be given back.

In the development of the phonograph several improvements have been made. An electric motor is used to turn the crank; wax replaces tinfoil in the cylinder; bifurcated ear-tubes are used for hearing, and progress has been made in other directions. One of the later developments is the graphophone, from which, by the aid of a large trumpet, the record of the phonograph can be transmitted to the ears of a large audience, without need of the eartube or other contrivance. In this a preparation of wax and paraffine is used, in which the fine steel point cuts a minute hair-line, scarcely visible to the naked eye, yet capable of giving a reproduction of a song, a speech, the sound of a musical instrument, etc., with remarkable exactitude.

Electro-Metallurgy.

Hitherto we have dealt with the methods of conveying intelligence by electrical and other agencies. We have next to deal with some other results of electric power. One of the earliest applications of the galvanic battery lay in the decomposition of chemical compounds of metals by the current, and the deposition of the pure metal for plating or other purposes. In the electro-plating process a solution of cyanide of silver is employed, and a current of electricity sent through it from a battery. A plate of silver forms the positive electrode and the articles to be plated form the negative. The electric current decomposes the cyanide, the silver is deposited in a thin film on the articles to be plated, and the cyanogen is set free at the silver plate, which it begins to dissolve, forming new cyanide of silver. With this the process is repeated, and it can be kept up while any silver remains, so that the article can be covered with a coating of silver of any desired thickness, and firmly attached to the interior metal.

Electro-gilding, or covering with gold, is performed in the same manner, and other metals can be similarly deposited by the

battery action. Among the most common of these processes is that of plating with nickel, also the covering of iron with zinc, producing what is known as galvanized iron. In this operation a solution of sulphate of zinc is employed.

Electrotype.

A highly important application of this principle is to be seen in the electrotype, in which copper or other metals are deposited upon moulds of coins, types, engraved blocks, medals, etc., of which faithful copies can be produced. The method was invented in 1837 by Professor Jacobi, of St. Petersburg. In a bath composed of sulphate of copper electrolytic action will decompose this compound, the copper being deposited upon a mould of the article to be copied, while the oxygen of the decomposed water forms oxide of copper with the copper of the positive plate. The oxide unites with the released sulphuric acid to form new sulphate of copper, and this is again decomposed, the process being successively repeated. One of the most important applications of this process is to prepare a duplicate in copper of pages of type, and thus release the type for other use. Engraved copper plates can be multiplied indefinitely, wood cuts be reproduced in copper, etc.

Medical Use of Electricity.

The use of electricity as a remedial agent is by no means new, and its employment is increasing. It is applied in three forms, the static, the galvanic, and the inductive, or Faradic. Static electricity, that of the old frictional machines, is little employed of late years, but the current from the galvanic battery is largely used, some form of the bichromate cell being commonly adopted. As the current has to traverse the skin, whose electrical resistance is high, a battery composed of a considerable number of cells, say from thirty to fifty, is deemed necessary. For the ordinary treatment of muscles, nerves, etc., disks, plates, or cones of brass or carbon, covered with flannel or wash leather, are applied to the skin; but if strong currents are used, large pads of moist clay, flannel, or sponge, ten inches or more in diameter, are necessary, a platinum or steel needle centring the current upon the part to be heated. With such a terminal a current of two hundred milli-amperes can be borne without inconvenience, but if the terminal be reduced to an inch in diameter, intense pain and rapid destruction of tissue may follow. As this is what is needed in the removal of tumors, strong currents and small terminals are employed.

In the employment of the Faradic method, the thick primary coil induces an alternating current in a secondary coil of fine wire, while a bundle of iron wires is used to strengthen the current by its magnetic action, it being slid in and out of the coil as variation in strength is desired. The currents from a Faradic machine thus alternate in direction, and can be readily varied in strength.

Benefits of Electrical Treatment.

There are a number of nervous affections, such as chronic neuralgia, chorea, hysteria, and others, in which static electricity may be usefully employed. For acute neuralgic pains, such as sciatica, tic-douloureux, etc., the galvanic current is used, also for atrophy of muscle following hemiplegia, diabetes, and other affections, in spinal irritation, lumbago, the stiffened joints from chronic rheumatism, chronic pharyngitis, glandular laryngitis, chronic tonsilitis, and other diseases arising from chronic inflammation and defective nutrition. The Faradic current is found to be of value in cases of nervous exhaustion attended with insomnia, in functional disorders of the generative organs, in acute articular rheumatism and in various other disorders of the articular and nervous system.

Electricity may be very usefully employed in the removal of abnormal conditions of tissue, such as nævi and aneurisms. Needles insulated nearly to their points are thrust into the tumor, and the current is sent through them, the result being to coagulate the contents around the needles, obliterating the nævus, or strengthening the walls and filling in the sac in an aneurism. By the use of a powerful current most cases of uterine hemorrhage may be checked, the positive current being carried by a thick platinum current to the mucous membrane

of the uterus, while a large surface electrode lies on the abdomen. Fibroid tumors of the uterus are subjected to similar treatment, as also various inflammatory conditions of this organ. As regards the use of "galvanic" or "magnetic" belts, from which many benefits are claimed, these benefits are far from apparent. It may be said that magnetism, however powerful, has no evident influence upon the human body.

In addition to its uses as a curative agent, electricity has also been usefully applied in surgery. A powerful current sent along a thin wire develops heat in such a quantity that the wire soon becomes white hot, constituting the primary form of the incandescent electric light. Such a wire can be used in galvano-cautery, to cut or burn off, and at the same time to cauterize, excrescences and growths which could not be easily reached except by a tube and a small loop of platinum wire. Also a little incandescent lamp, whose bulb is no bigger than a pea, is employed to light up and explore cavities,—even those of the throat and stomach,—a use of great promise in the art of saving life and avoiding suffering.

Electricity in Agriculture.

The physiological and anatomical action of electricity is not confined to the human body, but has been applied in plant growth, with beneficial effects. Both atmospheric and terrestrial electricity have been shown to favor the germination of seeds and the increase of plant tissue. In the use of atmospheric electricity tall poles are used as collectors and conducting wires ramify through the soil, with the result, as some claim, of increasing the yield one half. Professor Spechneff, of Kiev, claims that by the use of such an apparatus he obtained an increase in grain crops of from 28 to 56 per cent., and from 16 to 60 in weight of straw, while potatoes showed an increase of 11 per cent. By electrifying the earth the root harvest was made four times greater and that of leaves two or three times. When the seeds were electrified before planting their growth was nearly twice as rapid. In the United States similar experiments have been tried with varied results. Garden vegetables were in some cases spoiled, and in no case clearly benefited. The use of the electric light at night largely increased the growth of plants, but the interference with their periodical times of rest appeared to be injurious. It has been found that the influence of electricity is beneficial to flowers, which bloom much sooner and show finer and more brilliant coloring. In this case glass must be interposed between the light and the plant. What will be the ultimate result of these experiments, it is too soon to say, but it seems very probable that such an artificial stimulation of nature's processes is likely to be followed by a reaction, such as is apt to follow stimulation in animals, and that in the end there will be no beneficial gain in vitality or productiveness.

The Electric Light and Electric Motor.

We have given a number of highly important applications of electricity, all of which are due to the two older sources of electric energy,—the frictional machine, with its development of intensity of current, and the galvanic or voltaic battery, with its development of quantity. But for some of the more valuable electrical results, such as the electric light and electric motor, a new and more powerful source of electricity was needed, and this in due time was discovered, as an interesting outcome of electro-magnetism. The utility of the magnet both in telegraphy and telephony has been shown. In the new source of electric power it is indispensable, the dynamo being based upon a peculiar and highly useful relation between magnetism and electricity.

This relation is no recent discovery. It has long been known that on the approach of an armature to the poles of a magnet a current of electricity is induced in it, and that on its withdrawal from the poles a similar current, but in the opposite direction, is induced. If the ends of the armature be connected by a wire, these currents will flow through it and complete the circuit, however long, and their presence can be readily perceived by the use of the galvanometer, or by other means. There appears to be a measure of resistance in the magnet to the motion of the armature, and it is believed that the force necessary to

overcome this resistance is converted into electricity within the iron moved, and is the source of the current that appears. If the operation be reversed, the armature being fixed while the magnet approaches or recedes, the same effect takes place, temporary currents being induced. This principle, simple in its statement, has proved of immense importance, for to it we owe the now familiar dynamo, in use wherever large amounts of electricity are to be generated.

The Development of the Dynamo.

For the discovery of the principle above described we must go back to the days of Faraday. The first to apply it in a machine was an Italian named Pixii, in 1832. He mounted a horseshoe magnet on a shaft and made it revolve before two soft iron cores wound with wire, their ends being opposite the poles of the magnet. Afterwards he rotated the iron cores, and left the magnet fixed, as an easier process. As a result, he obtained rapidly alternating currents of electricity, changing in direction as the armature approached and receded from the poles of the magnet.

This apparatus was afterwards improved by combining a number of magnets and adding to the number of cores or armatures. In 1857, Professor Siemens, of Berlin, began to wind the wire from end to end of the armature, instead of round and round like a spool of thread, as before, the armature being now set crosswise to the legs of the horseshoe magnet. Other important inventions followed. The alternating currents were made to flow in one direction by means of the commutator, a device for shifting the opposed currents that came from the armature into one continuous line. Subsequently Pacinotti, of Florence, devised a "ring armature," in which the current flowed in one direction without the need of a commutator. Dynamos built on this principle are still extensively used for many purposes. Another highly important invention was made in 1866 by Wilde, of Manchester, England. After the current had been produced, he carried it back into coils of wire around the arms of the magnet, which at once grew more powerful. This increased the strength of the current, and this in turn gave new power to the magnet, until it had reached its highest possible strength.

Up to this time permanent steel magnets had been used, and the machines were called magneto-electric. Wilde's invention led to the discarding of these in favor of the soft iron electro-magnet, and the machine was afterwards named the dynamo-electric, a compound which soon became shortened to the one word, dynamo. It was this invention which made possible the huge field-magnet of the modern dynamo, which is not a magnet at all, in the strict sense. There is, indeed, some slight degree of magnetism in almost every piece of iron, enough to make a very faint current in an armature. Weak as this may be, it acts through the coils upon the soft iron core of the magnet, slightly increasing its magnetism. The current at once grows somewhat stronger, and this adds a second increment to the strength of the magnet. Thus, step by step, the current increases in strength and the great iron field magnet gains a more powerful attraction, soon reaching its highest power, and yielding a current enormously stronger than that with which the process began.

The Developed Dynamo.

Such were the steps of invention which led to the dynamo, that wonderful source of modern power. It was not practically known until 1870, when Gramme invented his continuous current ring armature, a machine much more powerful than any preceding one. As late as 1873 the word "dynamo" was not known, and magneto-electric machines were still talked of. Since then Edison, Weston, Thomson, and others have been busy in developing the machine which had thus slowly come into existence. In its use one fact clearly appears—nature never gives something for nothing. The dynamo gives back only the power that is given to it. It needs power to drag the armatures away from the attraction of the magnets, and as the machines increased in size some source of power greater than man's became necessary. The steam engine was early employed to whirl the armature rapidly before the poles of the magnet, and in the great dynamos now in

use engines of hundreds of horse-power are needed to overcome the immense resistance and to yield the great speed of rotation employed. More recently the vast power of the cataract of Niagara has been applied to this same purpose.

In present usage various forms of armature are in existence, such as the ring, the drum, the disk, the pole, and the spherical types. The latter, in which the coil is wound on the surface of an iron sphere, is the form employed in the Thomson-Houston machine. In the earlier machines the whole current was passed through the coils of the magnet, but, as a rule, only a part of it is now thus utilized, this proving abundantly sufficient to develop its magnetism. In addition to the continuous current dynamos there are many forms now used with the alternating current, the commutator being omitted. These are of importance from their use in connection with transformers in electric lighting. In the application of power through the medium of the dynamo some degree of loss is inevitable, but in good machines 90 per cent., or even more, of the driving power is preserved.

The Electric Motor.

What we have told is only half the story of the dynamo. Its purpose is to convert mechanical into electrical energy. To make this useful the reverse operation, that of converting electrical into mechanical energy, is necessary, and for this the electric motor is employed. The latter is simply a reversed dynamo. As a revolving magnet or armature causes an electric current to flow in the wire coils of the latter, so this current, passing through the coils of a second armature, forces this or the magnet associated with it to revolve, and with an energy capable of giving motion to connected machinery. A familiar example of this is the vigorous motion of the electric street-car, whose motor is simply a dynamo, varied in form and reversed in action to adapt it to its special purpose.

Faraday long ago showed that such a reverse action was possible, and various machines were made that did work on a small scale. It it said that the first was made in 1847 by an American named Moses G. Farmer. But it was not until after the invention of the Gramme machine that the full significance of the principle was observed, and then almost accidently. At the Vienna Exposition of 1873, there was a Gramme machine which it was intended to operate by a primary battery, in order to show that a battery current could operate a machine. There was also a second machine present, its purpose being to generate a current. But the primary battery happened to be wanting at the time for opening, and the perplexed electrician,—a Frenchman named Hypolyte Fontaine,—not knowing what to do, conceived the idea of connecting the two machines, and of working one of them with the current developed by the other. He borrowed a piece of wire from a friend and joined the two machines. The operating machine was connected as a motor with a pump, and to his utter surprise it went to work so energetically that the water was thrown over the sides of the tank. Here was more power than he had dreamed of, and he was obliged to use a much longer piece of wire, in order by its resistance to the current to bring the motor down to milder action. He had discovered not only the electric motor, but had demonstrated the extremely important fact that great power can be carried to a distance over a thin wire, and there employed to set machinery in motion. To-day power is thus conveyed from Niagara to Buffalo, and much farther in some other localities.

It is not our purpose here to describe minutely the forms of dynamos and motors in use. They are so numerous and varied that, to do so, would be to take far more space than we have at disposal and to deal in unwieldy technicalities. It must suffice to say that the dynamo is now very widely employed for the purpose of generating light and power, and varies in size from the small machine needed to light a single building to the huge ones installed in the Niagara power-plant, where there are some twenty dynamos, each developing 5,000 horse-power. These generate the alternating current, as this proves capable of conveying electricity for long distances with much less loss than in the case of the direct current.

The Electric Light.

There are two great purposes to which the powerful currents yielded by the dynamo are applied, the electric light (with electric heat as a secondary result) and the electric motor, with its many applications to the movement of machinery. Of little less importance to mankind is the electric furnace, which has of recent years proved of great utility. In the first named of these, the electric light, we are dealing with no new discovery. The principle of the incandescent light was discovered early in the nineteenth century, when it was found that a fine wire could be heated to incandescence by the passage of a voltaic current. The principle of the arc-light was known much earlier. It is embodied in the electric spark, which was the one evidence of the existence of electricity known in ancient times.

Setting aside natural phenomena, as the lightning and St. Elmo's fire, and all mere experiments with the electric spark, the first inventor of the electric light was Sir Humphrey Davy, who in the early part of the nineteenth century produced the arc-light with a battery of 2,000 cells. The mode of producing this light is as follows: When the terminal wires of an electric battery are brought together and then separated slightly an intense, bright light between them results, and this, because of its curved form, is called the electric arc. This light, in temperature as well as brightness, exceeds all other artificial sources of heat; by its means the hardest substances, even the diamond, being entirely consumed. The wires of the battery were seen to melt and drop off in globules, but it was found that hard carbon points on the wires would prevent this, as well as increase the intensity of the light. Davy used pieces of charcoal. Foucault, in his experiments in 1844, used carbon from the retorts of gas-works, which is much harder. Foucault's improvement led to the first practical use of the electric light. It was used to illuminate the Place de la Concorde, in Paris, being placed on the knee of one of the statues there, and amazing all beholders with its brilliant power. The carbon points, though not destroyed as rapidly as wire, yet of course must waste in the consuming heat of the light. In time the distance between them is increased until the light is interrupted, and they must be brought together again to renew the illumination. Thomas Wright, of London, invented the first apparatus for moving the points automatically toward each other, a feature which now belongs to several forms of electric lighting. As it has been found that the positive carbon wastes more rapidly than the negative, that point is made to move over a wider space than the other in the same interval of time.

In 1855 Jules Duboscq's electric lamp—thus far the most perfect of the kind—was shown at the Paris Exhibition, and Professor Tyndall, of England, adopted it for the illustration of his lectures on light and colors. In 1858 the works of the new Westminster bridge, London, were illuminated by Watson's electric light, and the following year the magneto-electric light, invented by Professor Holmes, was successfully tried at the lighthouse at Dover. In 1861 the French Government provided for the illumination of eight coast lighthouses by the electric light.

The Arc-Light.

Fifteen years passed before anything further of importance in the development of the arc-light was achieved, but in the year 1875 a Russian electrician of ability, named Paul Jablochkoff, on his way to the United States to visit the Centennial Exposition, stopped at Paris, where a noted chemist placed at his disposal a large laboratory. Here, in a few months, he made a great sensation, by his discovery and exhibition of the electric candle. In this the two carbons of the arc-light were placed side by side, insulated from each other, except at their extremities, by a fusible insulating substance, which encased and separated them. As the carbons wasted under the influence of the light, this substance also burnt away, leaving the upper ends of the carbons constantly exposed at the same distance apart. The light of these lamps was soft and steady, while very brilliant, and a large number of them soon came into use in Europe.

Up to the time mentioned the galvanic battery was the only source of the current used in the electric light, and was much too costly an agent for this light to come into common use under its auspices. The discovery of the dynamo made a revolution in this industry, the arc-light was greatly cheapened, and from that time forward the progress of this light has been steady and rapid. Previously only a single lamp could be used with effect in a circuit. If two were introduced, the pair gave less light than a single one. In 1879, C. F. Brush, of Cleveland, demonstrated that with properly constructed dynamos and lamps almost any number could be placed in a circuit, it being simply necessary to increase the strength of the current for every new lamp introduced. If one arc needed 50 volts, two would need 100, three 150, and so on. If large arcs are to be produced there are needed large carbons, sometimes as much as three or four inches in diameter, and using currents of 100 or 200 amperes in energy. The common street-light seldom yields more than 800 candle-power, but a large search-light may yield a glow equal to fifty million candles. This light, placed in the focus of a large parabolic reflector, can be turned in any direction, and may be seen, in a clear atmosphere, 100 miles or more away.

There are numerous varieties of arc-lights now in use, some of them having the carbons parallel, as in the Jablochkoff candle, others being regulated, like Wright's early invention, by clockwork or other means, which keeps the carbons at a fixed distance apart. The varied adaptations of this principle are covered by numerous patents, of which the best known in the United States is the Brush light. The details of clockwork for moving forward the carbon rods as they are consumed are too technical to be given here. There is another style of lamp in which the carbons are inclined to each other, and some very successful lamps, as the Soleil, are made on this plan.

The development of electric lighting, alike in America, Europe, and other civilized lands, has been enormous, and some of our cities are very largely lit up with this powerful agent of illumination. While exact figures are not to be had, it may safely be said that over 500,000 arc-lights and more than 20,000,000 incandescent lamps are now in use in the United States, the capital invested in this business being placed by conservative authorities at $1,000,000,000.

The Incandescent Light.

If we send an electric current through two wires, one of iron and one of copper, of the same length and thickness, the iron wire may become so hot as to yield a bright glow, while the copper wire is scarcely heated at all. This is due to the fact that copper is a far better conductor of electricity than iron. A poor conductor resists the passage of the current, part of which is changed from electricity into heat—from one mode of motion into another. Early attempts, then, to make an incandescent electric light consisted in sending the current through a fine wire, of poor conduction and high resistance, the heat generated increasing as the current grew stronger and the resistance greater.

As the high heat produced soon rendered metals unsuitable for this purpose, from its tendency to fuse them, Mr. Starr, of Cincinnati, in 1845, tried a fine wire made of carbon. This gave a bright glow, but it soon burned out. Then he sealed the carbon wire in a glass globe from which the air was exhausted. This, by removing the oxygen, prevented combustion, and the incandescent lamp was achieved. But the galvanic battery could not furnish the necessary current at a low enough price, and the invention was forgotten. It was not until after the arrival of the dynamo that the idea was revived, or rather rediscovered, a fine filament of carbon being enclosed in a hermetically sealed glass bulb from which the air was exhausted.

Chief among those who attacked this problem was Edison. In 1879 he set himself to the double task of making a lamp that would give a definite candle-power, and of dividing and distributing a current between numerous lamps on one circuit. After experimenting with a large number of vegetable fibres, he selected bamboo as the most suitable substance. By means of

machinery the bamboo is divided into small fibres, which are pressed in U-shaped moulds and then carbonized in ovens. They are then attached at their ends to platinum wire, and placed in the glass bulbs, the platinum being fused into the stopper of the bulb and connected with the copper conducting wires outside. Such is the general principle of the incandescent lamp. Other inventors use other sources of carbon, and in some instances the bulb, instead of being exhausted, is filled with nitrogen or other non-supporter of combustion. The Swan lamp uses cotton fibres soaked in sulphuric acid and carbonized, the Maxim lamp Bristol paper, the Lane-Fox lamp hemp fibres, the Bernstein lamp—one of the most brilliant—silk carbonized in coal-dust. But in no case are the filaments permanent. They are gradually consumed, and after about four hundred hours' use a new lamp usually needs to be introduced.

The second problem attacked by Edison, that of dividing the current between the lamps, he solved by connecting every lamp to both wires from the dynamo, so that each should be independent, the wire feeding them crossing between the dynamo wires like the steps in a ladder. This is known as "parallel distribution." In the opposite method of "series distribution" the lamps are so placed that the whole current goes through each. In the first system any lamp may be turned on or off without interfering with the others, the current from the dynamo varying with the number of lamps lighted. In the second, the current varies with the number of lamps in the circuit, as it must traverse them all. It scarcely needs to be said that the current is turned on or cut off by means of a key, the turning of which serves to light or extinguish the lamp.

Other Methods of Electric Lighting.

The above are not the only methods of producing light from electricity. If a current be discharged through a glass tube whose vacuum has been made very complete, a glow of light appears. Geissler's tubes are of this kind, though the amount of light they yield is small. MacFarlane Moore, of New Jersey, has lighted large vacuum tubes, several feet long and two or three inches in diameter, by sending very rapid discharges of strong currents through a vacuum. A very high electric pressure is produced, the tube shining with a light of thirty or forty candle-power. Tesla, by the use of his enormously rapid alternations of powerful currents, has made wonderful exhibitions of the electric glow, which flows brilliantly from the end of a single wire, and he thinks it possible in the future to suffuse a whole room with such a glow of electric illumination. But as yet no practical result has arisen from these varied experiments.

Electric Power and Its Transmission.

There are at present in use two sources of electric power, the dynamo, which utilizes the energy of steam or water, and the storage battery, based upon chemical action. The former is the one most in evidence. It is applied to a large number of purposes, chief among which is electric traction. Aside from this, numerous small machines, of varied kinds, are run by electricity, and motors, small or large, may be employed for almost any purpose to which the steam engine is applicable, varying from the small power consumed by an electric fan to the 1,000 horse-power Baltimore locomotives. The vast power, aggregating 100,000 horse-power, of the Niagara Falls electric plant is utilized in operating machines of varied kinds, largely situated at Buffalo, some twenty miles away. This distance is much exceeded in other localities, one plant in California generating electricity from water-power, and transmitting it for use to a distance of 83 miles. Wherever a dynamo can be installed, a distributing centre of power may be provided. The first-class battle-ships *Kearsarge* and *Kentucky* manufacture their own current and use it in all parts of their internal organization, electric motors doing everything, from steering the ship to handling the huge guns and the turrets that contain them.

The Storage Battery.

It must be noted that the term "storing electricity" conveys, usually, an altogether erroneous idea to the uninitiated. They are apt to conceive of it as pouring electricity into some receptacle, as we pour oil into a lamp,

THE MOVING FOOTWAY

Operated at Paris Exposition 1900, for a distance of 2½ miles, and capable of carrying 40,000 passengers at a time. Erected on tall trestles, it consists of three floors; the first is fixed and the other two move at rate of 2½ and 5 miles per hour respectively. The motive power is supplied by shafts turning racks and pinions. Passengers can step from one platform to the other. At intervals there are seats. The electric railway is seen near the walk.

to be used when needed. But, in fact, electricity is an energy, not a substance, and therefore is not capable of storage in the ordinary sense. What is really done by the "storage" apparatus is to convert electricity into chemical energy, under such circumstances that, by proper arrangements, it may be readily converted back into electricity. The secondary batteries used for the storing purposes are more correctly termed accumulators. The first battery of this kind was made by Ritter about 1840, and it consisted of a series of disks of a single metal, alternated with cloth or card moistened in a liquid by which the metal would not be affected chemically.

In 1859 Mr. Gaston Planté made a secondary battery, for which he used plates of lead. Passing a current through these, lead oxide was deposited, and, after the charging current was removed, the lead and lead oxide were found to yield a very slight current. To increase this Planté devised the plan of first charging the plates, then discharging, then charging again with the battery current reversed, and so on, until, by repeated oxidations and subsequent reductions of the oxidized material, very porous plates were made. These, by their porosity, exposed a large surface to the oxidizing action of the current, so that a small porous plate took up as much electricity as one of large superficial area. Planté found that by connecting a number of cells together, and, after charging them, arranging them in series—that is, the positive plate of one connected with the negative plate of another, and so on—he could store for use quite powerful currents of electricity.

In 1880 another electrician, M. Camille Faure, devised the plan of coating Planté's lead plates with red lead, and then encasing them in flannel. The advantage of the red lead is that it is very quickly made porous, and therefore the process of repeated charging of the plates, known as the "forming" process, was reduced from weeks to days, and even to hours. This discovery, by reducing the time and expense of making the secondary battery, gave it a commercial value that it never had before, and it was hailed as a great advantage. Since that time a number of patents have been obtained for storage batteries, and they now exist in different forms, but generally modeled on the inventions of Planté and Faure. The efforts of inventors have been mainly directed toward reducing the weight of the cells, and to devising new ways of holding the red lead on the plates; this, from its porosity, having a tendency to fall off.

Chemical Action in the Storage Battery.

A storage battery, it may be said, is an apparatus of the type of the galvanic battery. There exists in it dissimilar chemical conditions, the spongy lead being opposed to the oxide, or rather peroxide, of lead. These set up galvanic action, the oxygen of the oxide attacking the pure lead, with the formation of an electric current. The result is that the peroxide (PbO_2) becomes monoxide (PbO), while the spongy lead is oxidized into a monoxide. When this is completed the chemical diversity disappears and the current ceases, but by sending an electric current through the cell the operation is reversed, peroxide and spongy lead are reproduced, and the battery is put again in shape for action.

The storage battery is specially useful for traction purposes of a kind to which the ordinary current cannot be conveniently applied, as for automobile carriages, electric boats, or cars running independently. In the latter each car is provided with a set of storage cells, placed under the seats, and replaced by others when near exhaustion. This system cannot compete in cheapness and efficiency with the trolley system, and the storage battery is now used only where the dynamo current is not available, or is utilized in storing up current which is not needed and is running to waste, preserving it for later employment. Thus in the case of wind-mills, tidal-motors, or other utilizations of the forces of nature, the power engendered, when not otherwise employed, can be used in charging storage batteries for later use, and in such ways this device may in the future become largely employed as a useful power-saver.

The Electric Railway.

One of the earliest and most important applications of the current from the dynamo

was its employment for traction purposes. As early as 1880 three persons, S. D. Field, Dr. Siemens and Thomas A. Edison, applied for patents for inventions in this direction. Field was the first to file his application and obtain his patents, which covered the use of a motor in or under the car, operated from a central source of electricity. In these early conceptions it was proposed to carry the current on the rail. Several short railway lines were constructed in Europe on this principle. One laid at Lichterfelde (Berlin) in 1881, used the two rails as conductors, but not with success. The longest was that between Portrush and Bushmills, in the north of Ireland, constructed in 1883. This, six miles in length, used a third rail beside the roadbed and 17 inches above the ground, for the conductor, it being supported by insulated posts. The current was conveyed to the car-motor by steel springs, one at each end. In the Edison and Field railway, 1553 feet long, which was exhibited at the Chicago Exhibition of Railway Appliances, the third rail lay between the other two, and the current was taken from it by stiff wire-brushes pressing on each side of the rail.

There were several objections to this system, an important one being earth induction, with its resisting action upon the current; the result being that the overhead trolley system came first into use, the trolley being a small, grooved wheel running upon a wire supported by poles in the air, and conveying the current from the dynamo. The current is conducted downward by a metallic pole leading from the trolley to the car and is conveyed by insulated conductors to the motor, which is usually placed under the car and geared to the truck-axle. In a recent improvement the axle is made to serve as the shaft of the motor armature.

Central Power Houses.

Electric railways possess central power-plants, in which great dynamos and powerful engines are installed, capable of furnishing current to many miles of track and a large number of cars, the conductors being thick copper wires. In most systems the current, after passing through the motor, is carried to the rail and thence into the ground, but in some there is a "metallic circuit," two wires being employed. The motorman, by the use of the lever at his hand, can make or break the current at will, or introduce "resistance coils," so as to regulate the strength of current supplied to the motor. The varying speeds of the car, and its easy stoppage, are readily controlled.

In a number of instances the conducting wire is carried underground instead of overhead, a more costly but otherwise successful system. One of the earliest examples of this was at Budapest, Hungary. In the city of New York—not Greater New York—law forbids the use of the trolley system, and that city was confined to the horse-car railway for years after other cities were enjoying the far more expeditious and satisfactory trolley-car. The underground electric system is now being gradually introduced there, and must eventually banish the horse from this field of duty. In 1899 the Third Avenue Railway was changed from cable traction to the underground conduit electric service, and with complete success. It is expected that in a few years every street railway in the city will be equipped with this electric system.

Feeders for Over-Head Trolleys.

In the overhead trolley system separate feeding wires are carried from the central station, their purpose being to supply electricity to the main wire at successive points in the line. In cities these are carried under ground, ascend the supporting poles at intervals, and are extended from the tops of these poles to the central trolley wire. In the underground system two methods are in use. In one of these a continuous bare conductor is placed in a conduit with an open surface slot, the current being taken off by means of a traveling brush or roller, known as a plow, sled or shoe, through which the electric force reaches the motor. In the other the conducting wire is divided into sections, so arranged that each section receives the current automatically as the car passes over it. The wire is ingeniously lifted by the attraction of magnets under the car, touches short

sections of conductive material in the top of the conduit, and supplies electricity through them to the motor. When the car has passed the attraction ceases, the wire falls, and the connection is broken, while the succeeding section of the conduit is brought into action.

Progress of the Electric Railway.

The general railroad system was only a few years old when the first proposition to run cars by electricity was made. In 1835 Thomas Davenport, of Brandon, Vermont, constructed an electric car, operated upon a circular track by a current obtained from galvanic cells. In 1842 Robert Davidson, of Scotland, propelled in this manner a five-ton car which ran four miles in an hour. In 1850 Professor Page, of the Smithsonian Institution, Washington, employed the current from 100 large Grove cells in operating an electric locomotive. He developed 16 horse-power and obtained a speed of 19 miles an hour on the Baltimore and Ohio Railroad. But the cost of the power confined these efforts to experiments, and the true era of the electric railway came only after the invention of the dynamo.

Mileage of Electric Railways.

Of the trolley street-railways, the earliest was established at Richmond, Virginia, in 1887, and began operations early in 1888, with twenty cars. Others quickly followed, and by the end of that year there were nearly 150 miles of track in the United States and Canada. By 1892 over 450 roads were established, with more than 3,000 miles of track and nearly 6,000 cars. In 1897 there were in the United States 15,000 miles of street-railway, of which 90 per cent. were operated by electricity. These used more than 25,000 cars, and employed a capital of about $1,500,000,000. By the end of the century nearly the entire street-railway service of the United States was operated by electricity, there being more than 1,000 railways, with a capital approaching $2,000,000,000. These were not confined to city streets, but extended like rays miles into the country, while in addition numerous rural lines existed, connecting small towns and covering very many miles of country roadway. One may travel from Paterson, N. J., to Portland, Me., by a nearly continuous line of electric rail, and from Chicago to Milwaukee, a distance of 85 miles. Still longer ones are projected. A similar system had also widely invaded Europe, and trolley cars were running in Capetown, South Africa; Sydney, Australia; Madras, India; Bangkok, Siam, and in cities in various other remote parts of the world.

The Elevated Electric Railway.

The first elevated electric railway in Europe was the Liverpool Overhead Railway, seven miles long, opened in 1893. In the same year an elevated electric road was run in the World's Fair grounds at Chicago, in which city the Metropolitan road began operation in 1895, and the Lake street elevated was operated by electricity after 1896. The elevated roads of New York, long worked by steam, began to change their motive power to electricity near the end of the century, the "third-rail" system being used there as in Chicago. Underground electric roads have also been installed, there being somewhat extensive systems in Boston and London. In the latter city, as also in New York, underground electric traction on a large scale is likely to be established in the near future.

Electric Locomotives.

The application of electric power to heavy railroad traffic has been made to some small extent, the most notable instance being in the Baltimore Belt-Line Tunnel. In this steam locomotives have been discarded, and powerful electric locomotives, operated on the overhead wire system, have taken their place, drawing heavily-laden trains daily through the tunnel. The great advantage of the use of electricity in tunnels and excavations is the escape from the serious annoyance of smoke, noxious gases, soot, and general unpleasantness. It seems probable that the electric system may in coming years displace steam on surface roads in general, the third rail being employed, with suitable precautions, to protect the public from death by contact with this apparently harmless but really very perilous stretch of loaded iron.

Electric Telpherage.

Electric carriage has been applied in other ways than those mentioned. A system known as Telpherage was devised by three English electricians, Jenkin, Ayrton, and Perry, and first applied in 1886 on a line about a mile long at Glynde, near Lewes, England. It was used to transport clay from a pit to a railway, so as to avoid cartage over fields and water. Another was erected in Cornwall to transport minerals from a mine over a difficult section of country. The system has also been used to transport logs from a forest. In telpherage the conducting wire is suspended in the air on posts or otherwise, while small electric motors run on the wire, which supplies them with power. From these motors are suspended carriages, in which the load to be moved is placed. The system has its advantages, especially if water-power is convenient to generate the current, but it has as yet been little employed. Reference should be made here also to attempts to move canal-boats by electricity. This is still in the stage of experiment.

Heating and Cooking by Electricity.

It becomes important now to consider another application of electricity, closely connected in character with the electric light, that of electric heat. It is well known that electricity develops heat in passing through even the best conductors, and that if the conductor be poor a large quantity of the electric motion is transformed into heat of the conducting substance. The temperature is greatest where there is a partial break in the circuit, as in the arc-light, whose temperature rises in the central point of action to about 6,000° F., twice the degree necessary to melt iron. When there is no break, but considerable resistence exists, much heat is also produced. This fact has been utilized in the heating of street-cars and also for cooking and general heating purposes. The heaters consist of coils of circuits of some refractory metal, the wires being of the thickness adapted to produce the greatest heating effect. The coils are placed inside metal boxes or radiators, which receive and throw off the heat. If it is desired to heat water or some other liquid, the coils or the radiating boxes are placed in the liquid, so that it may absorb all the heat evolved.

In the street-car the heater uses up a considerable portion of the energy, and cannot be largely employed without an increased power-plant. Various electric cooking utensils have been devised, though the cost of the current stands in the way of their rapid adoption. Each of these carries its own heating coil, and it is only necessary to attach the wire and turn the switch to bring it into service. Its great advantage is the ease and rapidity of action, the absence of ashes and dust, and the escape from the vexations of ordinary fuel. The only thing that prevents the general use of electricity as a means of cooking and house-heating is its cost. A sufficient reduction in this may revolutionize the system of household light and heat and introduce ease and cleanliness into the kitchen.

The Electric Furnace.

In another direction electric heat is being very usefully applied. The exceedingly high temperature produced by the voltaic arc has put into the hands of practical men a most efficient agent, enabling them to fuse refractory substances which hitherto defied their efforts. The electric furnace finds one of its applications in the extraction of metals from their ores. The crushed ore is permitted to fall through the arc, by which it is melted ; the liquid substance being received in a vessel in which the separation of the metal can be effected. In other furnaces the ore is placed between electrodes of some refractory substance and a powerful current passed through it. In the Cowles furnace, employed to reduce aluminium, melted copper forms an alloy with the aluminium as soon as separated. Among the important products of the electric furnace are carbide of calcium, the source of acetylene gas, and carborundum, or carbide of silicon, a substance not before known, but of great value from its abrasive powers.

Electric Welding.

Another important use of electric heat is in the welding of metals, which it performes

with a rapidity and perfection previously unknown. In this system, as devised by Elihu Thomson, powerful currents are passed through the metals, heating them to incandescence, and they are then caused to unite by pressure or hammering. In the dynamo used for this purpose the commutator is discarded, alternating currents very well answering the purpose. All that is necessary is to bring the surfaces to be united into firm contact, and pass the current through them. As it crosses the imperfect junction the resistance to its passage causes intense heat, sufficient to soften the metal, the pieces being at the same time pressed strongly together. Usually the metals are made to touch at a single point. This first heats and welds, and new parts come into contact, until all the surface is at welding temperature. The process is remarkably rapid, a few seconds sufficing to produce union in small work and only a few minutes being needed in large work. As the heating is confined mainly to the contact parts there is no waste of energy. Large masses of metal have been joined in this way, and rails have been united in continuous sections, after being laid in position in railroad construction.

The Transformer and Alternating Currents.

In the use of powerful currents, and their division and application to special purposes, one difficulty exists, which has been overcome by the ingenious apparatus known as the Transformer. At times powerful current and low voltage, or electo-motive force, are needed; at other times currents of reduced quantity and high voltage. The change from one of these conditions to the other is effected by the transformer. This consists of an induction coil in which the primary wire is long and thin and the secondary wire short and thick. Alternating currents of small strength but considerable voltage can be sent with little loss over long wires, their high potential aiding them greatly in overcoming resistance. Thus, by aid of the transformer, they can be converted into currents of considerable strength and low voltage. In this way currents of small quantity may be economically sent over thin wires from generating stations, and there changed into currents of large quantity but reduced force by the thick wire of the transformer. A current of 10 amperes, at 2,000 volts, may be changed into one of twenty times its strength, or 200 amperes, with only one-twentieth its voltage, or 100 volts. This is technically known as a *step down transformer*. In the *step-up transformer* the action is opposite to that described. By use of the latter, Tesla succeeded in obtaining currents of very low strength but enormous voltage. A powerful current of 2,000 volts will exert on the human body the process named Electrocution, producing instant death. But Tesla has passed currents of 200,000 volts through his body without injury. In these the electro-motive force was so intense that the electricity streamed from parts of his body into the air. As already stated, a room can be illuminated in this manner, copper plates being placed in the ceiling and floor, while the glow comes from vacuum tubes anywhere between them.

Electric Blasting.

Among the applications of electric power not already mentioned is the important one of exploding gunpowder or other explosives by the electric spark, a method long employed and of great utility. Danger to operatives in blasting is greatly reduced when the old-fashioned time-fuse is replaced by long wires and the work is done by simply bringing the ends of the wires into contact. In some great operations the use of this system is indispensable. Such was the case in the blowing up of the reefs at Hell-gate, New York. Here the rock was extensively tunnelled, many ramifying passages being made, and a large number of dynamite blast charges were introduced. It was necessary for the full effect that these should be exploded simultaneously, and the only known method by which this could have been done was by the use of electricity, the whole series being connected by wire, so that the passage of the current produced simultaneous sparks in each charge. In underwater explosions, as of mines in naval warfare, electricity is similarly useful, and in this direction generally its importance is obvious.

Electrocution.

We may, in passing, allude to another recent use of the electric current, that of capital punishment with its aid. This has been the method of execution in New York State since January 1, 1889, and in Ohio since July 1, 1896. The first criminal to suffer death by this method was a murderer named Kemmler, who was executed August 6, 1890. He was fastened in a specially constructed chair, and the current passed through his body from the top of the head to the lower part of the spine, contact being made with moistened sponges. An alternating current was used, with a voltage of over 1,500. Seventeen seconds sufficed to produce apparent death, though contact was repeated for 70 seconds to make assurance absolute. In all later executions one electrode has been applied so as to cover the forehead and temples and the other placed upon the calf of the leg. In addition to these legal executions by electricity, what may be called involuntary electrocution is of somewhat frequent occurrence, through operatives and others coming into contact with heavily charged wires by accident or carelessness.

Resistance Coils.

These are coils of wire introduced into an electric circuit, and of use for various purposes, one of these, as already stated, being to produce heat, another being to locate faults in telegraph wires or cables. For this purpose the coil is arranged in sections, so contrived that new sections may be introduced at will, and the resistance successively increased or diminished. By an ingenious use of these resistance coils the locality of a fault in a cable or an underground wire can be very neatly traced, the resistance of the remaining wire closely indicating its length, a fact of inestimable advantage in prompt and economical repair.

Units of Measurement.

There are units of measurements which recent progress in electrical engineering has rendered necessary. These units have been named after the great discoverers in electrical science, a well-deserved and practical way of perpetuating their memories. Two of these we have already mentioned, the ampere and the volt. The ampere is the unit of current, the volt (shortened from Volta) that of pressure or electro-motive force, the ohm that of resistance. One ohm equals the resistance of a hundred feet of copper wire of the size of a pin, and one ampere the current which one volt of pressure will force through one ohm of wire. The coulomb is the unit of quantity of one ampere flowing for one second, and the farad (shortened from Faraday) the unit of capacity to contain one coulomb. Other units are the henry, representing the induction which a wire exerts upon itself when the current is made or broken; the joule, the unit of heat developed in passing one ampere through a resistance of one ohm; and the watt, the unit of power, it being equivalent to a volt-ampere, or the combination of current and pressure. These units of measurement are in constant employment by electricians, and are of great utility in the practice of their profession.

THE FORCES OF NATURE

Heat is of almost supreme importance in human affairs, since the employment of electric power is very largely a secondary application of the force of heat, and steam power is directly due to heat. As a preliminary, therefore, to the discussion of our special subject, a brief statement of the scientific aspects of this very useful agent of nature will be in place.

The Caloric Theory of Heat.

Heat, like other powers of nature, was long misunderstood, its true nature and origin not being generally perceived until the nineteenth century. It was previously supposed to be a subtle and imponderable form of matter, capable of penetrating all material things, and known by the name of Caloric. The entrance of this substance into our bodies was held to be the cause of warmth, its departure that of cold. Its particles were supposed to repel each other and attract those of other substances, thus causing contraction and expansion. And it

was thought that compression, as when iron is condensed by heavy blows, left less room for caloric, so that it was forced out, producing external heat.

Heat as a Mode of Motion.

This theory is no longer entertained. Heat is now believed to be a motion, not a substance, and the name Caloric is becoming one of the lost words of our language. This idea, it is true, is not strictly a new one. It was advanced by Lord Bacon, several centuries ago, and later by Locke and Descartes. In 1797 Count Rumford (originally Benjamin Thompson, an American) advanced a similar theory, based upon his observations on the boring of cannon, in which the quantity of heat produced seemed out of all proportion to the small weight of metal removed. He concluded that anything which an insulated body could yield *without limitation* could not possibly be a substance, and that it must be a motion. But these views gained little attention, and the material theory of heat remained in vogue.

A few years later Sir Humphrey Davy gave the caloric theory what was practically a death-blow, by showing that heat could be generated by the friction of two pieces of ice in a freezing temperature, either in the air or in a vacuum. The ice was liquified by the friction, being converted into water, whose heat-containing powers are much greater than those of ice. If heat, then, were a substance, the water should have grown colder; and the production of heat in this instance proved that it was a result of the force of friction, and therefore motion instead of matter. This view was still disputed, but it soon became generally accepted, and in 1843 Mr, Joule, of Manchester, developed a heat-unit, by showing that one degree of heat is produced by the expenditure of 772 foot pounds of work, or that one pound of water, falling 772 feet, will have its temperature raised 1° F. by collision with the earth.

Transference of Heat.

Heat is now believed to be due to rapid vibration of the minute particles, or molecules, of matter, which dart back and forth with an energy that is capable of performing mechanical work. The sensation of warmth is the result of the flow of this motion into the flesh, causing its particles to move more rapidly, and thus affecting the nerve terminations; cold comes from the loss of this motion. The heat motion escapes from all substances in the form of radiation, and heat continues to make its way from warmer to colder substances until their speed of molecular motion is the same and equilibrium is established.

Heat of the Sun.

There are two main sources of heat, the emanations from the sun and chemical action upon the earth. Our solar orb pours forth continually an extraordinary volume of this motive force, much of it reaching us as light, or visible heat, much more as invisible heat, the rate of vibration of the latter being above or below that of light. It has been calculated that the heat received by the earth in a year would be sufficient to melt a stratum of ice surrounding the whole surface and 105 feet in thickness. But the sun actually sends out 2,300,000,000 times this amount of heat, since only a minute fraction of its total emissions reach the earth. It is calculated that the heat at its surface is sufficient to melt ice at the rate of 2,400 feet in thickness every hour, and that if it was composed of burning coal it would be reduced to ashes in 5,000 years. All the vast number of stars—except the planets—which are visible in the heavens are sending out heat and light in similarly immense volumes, though their distance is so immensely great that we receive from each of them but little light and scarcely any traceable heat.

Terrestrial Heat.

There are three general sources of heat upon the earth's surface. It is yielded by mechanical motion, when this produces friction, percussion or compression; also when motion is checked or stopped by any means. It is yielded by electricity, as in the effects of lightning, or of the flow of a current along a poor conductor. But its principal cause is chemical action, the union of chemical elements into compounds, or of compounds with one another, the usual

result being an outflow of heat of greater or less intensity. A fourth source of terrestrial heat is its upflow from the heated interior of the earth, which seems to be in a greatly heated state. We gain vivid evidence of this in the ejection of molten lava from volcanoes, but the ordinary outflow of heat through the earth's crust is very slight, it being estimated to raise the temperature not more than $\frac{1}{80}$ of a degree.

Combustion.

Chemical action varies greatly in its intensity and its production of heat. In one case it may proceed in the slow manner of the gradual decay of wood or rusting of iron; in another by the rapid oxidation, or the burning, of these substances, with the emission of intense heat and light. In other instances its action is still more rapid, as in the case of the explosion of gunpowder or dynamite, in which chemical combination is practically instantaneous, great volumes of gas resulting and expanding with explosive force. This explosion is really due to heat, or the vibration of the molecules, which are set free from the force of attraction and rush outwards with all their native energy. But what we are here especially concerned with is ordinary combustion, the union of the oxygen of the air with the carbon of wood, coal, or other combustible substances, which forms our most useful source of heat.

Uses of Heat.

The application of the heat of combustion to man's uses is one of the chief means of rendering the earth habitable outside the tropical regions. By its aid the chill of winter is overcome and the food substances of the earth are rendered far more palatable. Of its other uses the most important is its employment as a power-producer, usually through the conversion of water into steam and the use of the latter in the steam engine. In this process coal is now the fuel generally used, though petroleum, natural gas, and other combustible substances are employed to some extent. It may briefly be said that water boils at the comparatively low temperature of 100° C. or 212° F., that one cubic inch of water expands into 1,700 cubic inches of steam, and that this steam exerts a powerful pressure, the conversion of one cubic inch of water into steam being equivalent to 2,125 foot-pounds of work.

The Steam Engine.

The steam engine, useful as it is to man, is of very late origin, though its principle was recognized more than 2,000 years ago. The first steam engine on record is the Eolopyle (*Æolus*, the God of the Winds; and *pila*, a ball) of Hero of Alexandria, who lived about 120 B.C. This machine consisted of a hollow globe containing water, capable of turning about a horizontal axis, and having two bent tubes with small apertures inserted in a plane perpendicular to the axis at its centre. When the globe was heated the steam escaped from the tubes, and by its reaction caused the globe to revolve. Porta (1580), De Caus (1615), and Worcester (1663), conceived independently the idea of employing the pressure of steam to raise water. Subsequently (1698) Captain Savery took out a patent for a machine on the same principle for raising water from a mine. In 1690 Papin thought of using steam to raise a piston, and in 1705 Newcomen constructed an engine worked by a piston moving in a cylinder. The steam from the boiler passed to the lower part of the cylinder and raised the piston. The steam was then cut off, and a jet of cold water sent into the cylinder so as to condense the steam contained in it. The upper part of the cylinder communicated with the air; consequently, after the condensation of the steam, the atmospheric pressure and its own weight brought down the piston. The communication with the boiler was then renewed, and the whole action repeated. In 1763 James Watt, of Glasgow, while repairing a Newcomen engine, conceived, and, by laborous study, realized improvements which constitute the chief features of the modern steam engine.

James Watt's Engine.

The improvements which have immortalized the name of Watt are the following:—

1. In order to avoid the waste of heat consequent on the alternate heating and

REMOVING THE IRONS FROM THE INSANE

The opening of the 19th Century was marked by a kinder treatment of the insane. They were no longer manacled, but placed in pleasant surroundings. This scene represents Doctor Pinel, in the first great French Hospital, ordering the chains to be removed from an insane patient. Through his efforts, with the

cooling of the cylinder, Watt introduced a condenser apart from the cylinder. When the piston reached its highest point, therefore, he opened a communication between the lower part of the cylinder and a separate chamber into which a jet of cold water was made to play, its effect being an immediate condensation of the steam.

2. Watt also introduced an air-pump into the condensing chamber to remove the heated water and air.

3. Another improvement was the *double action* on the piston. The steam was introduced above and cut off from below when the piston was required to descend, and the communication above was closed and that below opened when the piston had to ascend.

4. Watt also introduced the plan of cutting off the steam before the piston reached its limiting position, so that its momentum should be destroyed gradually, and not by a sudden percussion at the end of the stroke.

Low-Pressure Engine.

Watt's engine was what is now known as a condensing or low-pressure engine. In modern practice non-condensing or high-pressure engines, in which the steam, after moving the piston, passes directly to the atmosphere, are very generally used. The first of these, of a practical character, was invented about 1787 by Oliver Evans, of Philadelphia. It is now usual to employ steam of a higher pressure than formerly, even with condensing engines. The force of the steam from the moment the steam valve is closed is continually diminishing to the end of the stroke, and if it were cut off at a small fraction of the stroke, it might become so attenuated as not to drive up the piston. On this account, when the expansive system is used, steam of higher pressure is employed. The term high-pressure, however, has been generally applied to engines in which the exhausted steam is driven into the air. Such steam must evidently always exceed the pressure of the atmosphere.

High-Pressure Engine.

The non-condensing engine is more simple, and consists of fewer parts than that which has been described. It is generally used for locomotive engines, steam carriages, and steam vessels required to possess lightness and rapidity. Although it is more elementary and simple than the other, it was not invented until many years after the condensing engine had been brought nearly to perfection. In condensing engines the pressure of the steam in the boiler is much lower than in non-condensing, in which the boiler-pressure has been increased until pressures of 200 pounds per square inch are now common, being eight times as much as was usual about 1860.

The locomotive engine differs from the stationary engine in several important features. Such engines require to be smaller and lighter than others; hence the apparatus for condensation is rejected, and high-pressure is used. The boiler is an oblong cylinder, through which a number of tubes are arranged horizontally, in communication with the furnace and chimney. By this means a very large surface is heated in contact with the water. After moving the pistons, the steam escapes from the cylinders by two pipes meeting in a common tube or blast-pipe, which passes into the chimney. When the expedient of turning the exhausted steam into the chimney was first adopted by George Stevenson, it was found that the speed of the locomotive on which the experiment was tried had been doubled.

How Steam-Power is Measured.

The working power of a steam engine is estimated in horse-powers, one horse-power being equivalent to 33,000 foot-pounds per minute, that is, the power to raise 33,000 pounds one foot in one minute. There are three kinds of horse-power referred to in connection with engines, *nominal*, *indicated*, and *actual*.

The *nominal* horse-power is found by multiplying the area of the piston in inches by the average pressure, and multiplying this product by the number of feet the piston travels in feet per minute, then dividing this last product by 33,000. The quotient will be the nominal horse-power of the engine.

The *indicated* horse-power is found by multiplying together the mean effective

pressure in the cylinder in pounds per square inch, the area of the piston in square inches, and the speed of the piston in feet per minute, and dividing the product by 33,000.

The *actual* horse-power is the indicated horse-power minus the amount expended in overcoming the friction. The following is a general rule for calculating the horse-power of an engine:

RULE.—*Multiply the area of the piston in square inches, the mean pressure of the steam on the piston per square inch, and the velocity of the piston in feet per minute, together, and divide this product by 33,000. The quotient will be the horse-power.*

In modern engines, of high initial boiler-pressure, it is growing customary to employ two or more cylinders, so as to use the entire pressure of the steam. Thus, if the initial pressure be 200 pounds and the steam be cut off at one-half, a pressure of 90 pounds can be obtained in a second engine, and if a similar cut-off be used, a 40-pound pressure can be utilized in a third cylinder, about 15 pounds in a fourth and 5 pounds in a fifth. Usually, however, this process is not carried beyond the third stage, double expansion being used for locomotives and large stationary engines, and triple expansion for the large engines of ocean steamers. These are termed respectively "compound" and "triple-expansion" engines.

Modern Engines.

The power of the steam engine has steadily increased from the time of Watt till the present date, engines of greater and greater horse-power being employed, until hundreds or even thousands of horse-powers in a single engine are not uncommon. The power employed in the great ocean passenger steamers, for instance, has increased until some of these are driven through the waves with a force of more than 20,000 horse-power, and cross the ocean in less than six days. Of course, this power is divided between a number of engines. A similar power is employed in the great battle-ships and cruisers of our navy, the *Columbia*, for instance, having 18,500 and the *Minneapolis* 20,862 horse-power. In stationary engines the power employed has been similarly increased, until enormous engines are now employed for pumping, ore-grinding, and other purposes, including the running of dynamos, whose extraordinarily high speeds are rapid consumers of power.

The Steam Turbine.

Of recent years steam has been adapted to the movement of engines in a new manner and with remarkable effect. In the Chicago Exposition of 1893 was shown an early example of this apparatus, known as the De Laval Steam-turbine. This novel invention was constructed on the principle of the turbine water-wheel, though of diminutive size, and consisted of wheels having deflecting plates, which were turned by the impact of the steam. This was admitted near the centre and discharged at the periphery, driving the wheels by its escaping force, rather than by its pressure, as in the steam engine. To obtain the best results with this apparatus, the wheels are rotated at a tremenduous speed,—fifty rotations a second in a wheel of four inches diameter developing five horse-power.

The most important application of the steam-turbine, up to the present time, has been to torpedo-boats. The first example of this was the Thornycroft torpedo-boat *Turbinia*, which was fitted in 1897 with the Parsons' steam-turbine, and was driven through the water at a speed never before attained in nautical records. It has been surpassed by the *Viper*, a later ocean-flyer, which has reached the extraordinary official mean speed of 36.58 knots, with a maximum speed of 37.1 knots per hour, doubling the rapidity of motion of the battle-ship against which it is designed to be used. To attain this speed 12,300 horse-power was employed. It is still an open question whether this machine can be economically and efficiently used in larger vessels. If it should be introduced, one result of great value would be attained, which is that the boats named, even when driven at their highest speed, show a total absence of vibration. All ocean travelers can appreciate the advantage of this, as compared with the extreme vibration of the high-speed passenger steamer, and it would be of equal value in war-ships, as giving the vessel a steady gun-platform.

Superheated Water-Motor.

Still another method of applying steam for power purposes has been recently devised, the employment of water in a state of intense heat. By subjecting it to enormous pressure while heating, water may be made to take up a large quantity of heat without forming steam. This superheated water is forced, under great pressure, into a tubular reservoir under the car-floor, insulating jackets of magnesium preventing the escape of the heat. By an ingenious device the water is made to fall, drop by drop, into a high-pressure cylinder, where, having room to expand, it at once flashes into steam. As the tanks become exhausted, they can be refilled at proper intervals along the road. The saving over the ordinary steam engine is claimed to be one-half, and in a recent test a speed of forty-five miles an hour was attained.

Water-Power.

In the steam engine the power of water in its gaseous form is employed, but nature has provided liquid water under conditions capable of yielding enormous power, with no expense beyond those of apparatus and operation. This is by the utilization of the energy of falling water, which is manifested in a vast multitude of descending streams upon the earth's surface. For this power we are primarily indebted to the sun, which lifts sea-water in the form of vapor high into the air. This, discharged from the clouds as rain or snow, on hill and plain alike, makes its way back to its mother-ocean, descending in thousands of slopes, rapids, and falls, each of which possesses energy capable of being used by man.

The total volume of water-power upon the earth is, as above said, enormous. Use has been made of it for a long period of time, and it is now employed to a very large extent. It has often, however, the disadvantage of being inconveniently located, for which reason the steam engine has largely replaced the water-wheel. Steam power, while more costly, has the advantage of adapting itself to use in any desired situation.

Electric Conveyance of Water-Power.

In the later years of the nineteenth century inventions were made which went far to put an end to the disadvantage of water-power as compared with coal and steam. It became possible to convert this power into electricity, convey the latter by wire for many miles from its place of origin, and reconvert it into power, while it was equally possible to divide and distribute the single current to hundreds of motors, small and large. In this the first step was taken towards dismissing the steam engine from many of its old fields of action and replacing it by the electric motor.

The great installation at Niagara, with its 100,000 horse-power, is thus largely utilized in Buffalo, and electric power of similar origin is in use in many other localities. It seems far easier to convey electricity on a wire than to carry coal in cars and carts, and the simple motor takes up but a fraction of the space needed for coal-storage, fire-room, boiler, and engine. When the problem of carrying electricity for much longer distances, without serious leakage on the way, is solved, and the cost of the power plant and its working is sufficiently cheapened, the electric motor is likely to come very largely into use. That this will be achieved, and in no long period, is a very probable event.

Water-Wheels.

The immediate apparatus by which the power of running streams and falls is utilized is the water-wheel, in some one of its various shapes. This consists of a wheel provided with buckets or float boards on which the water exerts its energy of motion. Water-wheels usually turn in a vertical plane around a horizontal axis, and are of three kinds, undershot, overshot, and breast wheels. In undershot wheels, used when there is a large quantity but slight fall of water, float boards on the surface of the wheel are immersed in the water, and moved by it as it shoots under the wheel. Overshot wheels are used where the fall is high and the water small in quantity. Here buckets of suitable shape stud the circumference of the wheel, are filled by the falling

water, and turn the wheel as their weight carries them downward. In the breast wheel both the weight and the impact of the water are utilized.

The turbine wheel, now very largely used, is a horizontal wheel with a vertical axis, the water being received and discharged in all directions around the axis. Both the weight of the water and the impact of its fall act to turn the wheel. Turbines have the advantage of being small in bulk in comparison with their power, and being applicable to high and low falls alike. In such great installations as the Niagara Falls power-plant they are the only form that can be conveniently introduced.

Tidal Motors.

The above are not the only ways in which the force of water is adapted to the use of man. In addition to the energy of falling water, there is an energy of lifting water that would far more than supply man's utmost needs, if it could be easily utilized. This is the lift of the tides, which passes twice daily around the earth. Tidal waters, indeed, rise and fall, and may be utilized in both phases. But this action ceases for a half hour or more at each turn of the tide, and for this and other reasons no successful effort has yet been made to take advantage of tidal action. If tidal motors are to be utilized there must be some way of storing up the power of the water when strong for use when weak, and the most convenient way of doing this seems to be by use of the electric storage battery. Some tidal motors have been constructed, but as yet very little use has been made of this immense, but inconvenient, supply of natural energy.

Air Motors.

Another great reservoir of power, provided by nature, is in the motion of the air, the winds, which are rarely quite at rest, though of highly variable strength. The use of wind power, through the aid of the familiar wind-mills, has been common for many centuries, these mills, with their rotating sails and internal machinery, being widely employed for such minor purposes as pumping water, sawing wood, grinding corn, and other agricultural needs. This source of power does not seem likely soon to be utilized for any more important purpose, the great irregularity of the winds in force and direction, and their frequent cessation, standing in the way of any general application.

There is reason to believe that wind-mills were brought from Asia to Europe during the Crusades, and it is certain that they were in use in Europe during the 12th century. Their employment increased until, by the opening of the 19th century, they were very widely employed. After that date the steam engine largely took their place, though they are still very familiar objects in the Netherlands and are numerous in France and the United States. In good situations and under ordinary conditions, a wind-mill can be trusted, as an average performance, to do eight hours' work out of the twenty-four. In some places they serve as an auxiliary to the steam engine, which is stopped when the wind sails begin to turn. In one such instance, at Faversham, England, a 15-horse-power wind-mill raised 21,000,000 gallons of water from a depth of 109 feet in ten months, saving the consumption of 100 tons of coal.

In former times the dome of the wind-tower had to be turned by hand to meet every shift of the wind, but about the year 1750, Andrew Meikle devised an appliance for moving the sails automatically so as to face every wind. Formerly a wind-mill sail was covered with a sheet of canvas, which could be fully spread or partly furled as the wind varied in strength. At present various other methods for "reefing the sails" are in use. Many other improvements in wind-mills have been made, and the light and graceful forms now seen in our rural landscapes are much more effective and easily managed than those formerly employed. But the variable character of the wind has hitherto forbidden its employment for any purpose where a steady and continuous power is needed. Lord Kelvin has advocated its use for charging electrical storage batteries; and this, in view of the vast amount of power going to waste in the winds, may in the future be widely adopted.

Hot-Air Engines.

Another application of the atmosphere as a motive power is in the form of heated air, which there have been many efforts to apply in the same way as steam. Inventions in this direction were made early in the 19th century; the first air engine which had any success being made by the Rev. Dr. Stirling, a Scotchman, in 1816. This was improved in 1827, and again in 1840, and various other inventions were made, several in France, and a half dozen or more in the United States. Of these the most generally in use is that produced by Ericsson.

The chief advantage of the hot-air engine is that it needs no boiler, thus avoiding the weight and the danger of this appendage of the steam engine. Air engines also are much the cheaper and need less skill and attention. But, on the other hand, the pressure of hot air is much less than that of steam, so that a considerably larger cylinder and piston are necessary. There are two classes of air engines, one drawing its supply directly from the atmosphere, heating it, and discharging it after use again into the atmosphere; the other employing a fixed supply of air, which is heated and cooled alternately. The Ericsson engine, the form most in favor in the United States, adopts the first of these methods. Belon's engine, a French invention, is the only one that has been used on a large scale in an important industry, this being an extensive paper manufactory at Cusset, France. This machine also uses air drawn directly from the atmosphere. Though of 120 indicated horse-power, only about 30 is actually utilized, the remainder being consumed in gathering the supply and overcoming the resistance, while there is a large loss of heat, the air escaping into the chimney being at a temperature of 450° F.

Compressed Air Motors.

The power of the air has recently been applied in a different form and with very useful results. In this method the air is condensed by pressure into a small fraction of its original volume, and then set free to exert its force upon machinery. Some of the first important uses of this powerful and convenient agent were in excavating the tunnels in the Swiss mountains and in the Hoosac Mountain, Massachusetts. At Mont Cenis, Italy, the air was compressed by the power of descending streams on the mountain side and conveyed by pipes into the tunnel. At Hoosac Mountain the air was compressed by steam power. The compressed air was used in working the rock drills in the tunnel, the ease with which the pipes conveying it could be moved from point to point and carried to greater depths rendering it very serviceable.

Despite the evident advantages of compressed air as a motive power, there have been certain difficulties which stood in the way of its general use. One of the first inventions to overcome these difficulties was the Beaumont engine, of English origin. This utilizes the entire power of the air, no matter how high the pressure may be. The air is admitted from the compressors into successive cylinders, the smallest being used first, so that, as the pressure falls, the volume of air increases, and the force is thus kept uniform. American inventors have of late years been busy in this field, and with very considerable success, particularly in the application of compressed air to the moving of street cars. Cars equipped with compressed-air motors were tried in 1896 and 1897 on some of the lines in New York city, and similar cars are in use in France, Switzerland, and elsewhere in Europe, as also on some American roads. Motors of this kind seem destined to come far more widely into use. Another utilization of compressed air is in the working of pneumatic tubes in the post-office service, letters being driven by its aid from the central to the branch offices in large cities.

Uses for Compressed Air Motor.

The uses to which compressed air is now applied are quite numerous, and only a few, in addition to those named, can be spoken of here. It is employed very effectively in drilling, stone surfacing, riveting, and for various other purposes in which a rapid and strong blow, easily moved or rotated, and varied in strength, is demanded. Power

rammers, for heavy work in foundries, are of recent introduction, and are being rapidly adopted in Europe and the United States. One of these machines, operated by one man, can do the work of from eight to twelve men. The rammers use air at a pressure of about 80 pounds per square inch, and strike from 250 to 300 blows per minute, the air supply being strictly under the control of the operator, who can make the blow heavy or light at will. A recently exhibited use was the chipping of toughened steel by a pneumatic hammer, the chisel, driven by air at 80 pounds pressure, conveyed in a flexible tube, cutting off thick slices of the steel at the rate of one foot in a minute. For such purposes as street-car motors the air is used at pressures much lighter than the above.

The Air Brake.

One of the most important uses of compressed air is in the air brake on railroad cars, which is coming universally into use. The pneumatic or dynamite gun is another invention, which was used with some effect at Santiago in 1898. The rubber tire of the bicycle wheel owes its elasticity to compressed air, and air cushions for invalids have been for many years in use. Cellulose silk is made by driving wood pulp by air pressure through minute holes in a metal plate. Compressed air is used in a hose for the dusting of railroad cars and shops. It is employed in machine shops for operating cranes, hoists, and tools. In short, its present and possible uses are so numerous that we cannot venture farther in naming them.

Liquid Air.

The liquefaction of air offers a new and remarkable source of power. Its rapid and great expansion when vaporized would render it extremely suitable for this purpose but for certain disqualifying circumstances. The principal of these is its active tendency to return spontaneously to the gaseous state, the result being that a steady waste cannot be avoided. These difficulties seem to stand in the way of its economical utilization as compared with steam or other usual sources of power. In the proposal to use it as an explosive in blasting the same difficulties exist, and the hopes of those who are seeking to employ it as an effective power-agent do not seem likely to be realized under present conditions.

Gas Engines.

There is a class of engines of small power in which coal gas mixed with air and ignited is used as a motor. Several varieties of these are in common use, much alike in principle, the construction being usually the same as in a horizontal steam engine, except in the parts that convey the gas. This is led first to a mixing chamber, where it takes up the proper proportion of air. The explosive mixture thus made is admitted in successive small quantities within the cylinder and there ignited, the gas resulting from its explosion exerting a pressure upon the piston. In some engines, of which the Lenoir is a type, an electric spark ignites the gas at the proper moment. In others, as the Hugon engine, the ignition is performed by gas jets. These are extinguished by the explosion, but are quickly relit by an ingenious arrangement. Some of the more recent of these engines work with gas under compression. Such engines have been greatly reduced in cost of operation, and can be run at an expense of two cents per hour per horse-power. This is not as cheap as steam, but the gas engine presents advantages of compactness, ease of management, etc., which render it desirable for certain purposes, such as the propulsion of automobiles or motor carriages. In the oil engine petroleum is used as a fuel on the same principle, it being vaporized and the gas exploded along with air. Gasoline, a highly volatile liquid distilled from petroleum, is now commonly employed in this manner in automobiles, in which service it competes favorably with steam and electricity.

The Solar Motor.

We have not exhausted in the above all the natural sources of power. In truth, the basic form of all of them remains to be considered, the vast streams of solar light and heat which pour upon the earth, and to which we owe the fuel that yields us steam-

power and the rain which is the source of our water-power. If the motive-power in the solar rays could be directly and easily utilized, all other sources of mechanical energy might be safely abandoned, but the attempts to make use of the heat of the sun in this direction have hitherto not been very successful. In the solar engines, of which a number have been invented, concave mirrors or reflectors are used to concentrate the rays upon a water-boiler, or in some other way to make use of the great heat thus obtainable. Among the workers in this direction, one of the most active and persistent was the celebrated engineer, John Ericsson, who devoted years to the effort to produce a solar engine suitable for use on the sunlit plains of southern California. He died before his experiments were completed, but others have taken them up, and a solar motor of much efficiency has been recently invented and is at present in operation at South Pasadena, California. This device consists of a concave reflector 34 feet in outer diameter and 15 feet in inner, it being zone-shaped like a lamp-shade. Its inner surface is covered with small mirrors, 1788 in all, each about 31½ by 24 inches, they being so arranged as to reflect the sun's rays to the focal point of the mirror. At this point is suspended a boiler 13½ feet long and with capacity for 100 gallons of water and a steam capacity of 8 cubic feet. The steam is carried by tubes to an engine, and after condensation is returned to the boiler. The reflector is turned towards the sun, and is moved by clock-work, so as to face the solar orb all day long. The heat at the focal point is intense, and so far yields ten-horse power of steam, though fifteen is claimed for it. It is engaged in pumping water for the irrigation of arid lands, and is capable of lifting 1,400 gallons per minute. The inventors are experimenting with the purpose of storing electricity during the day so as to run the engine at night and in cloudy weather, also with the idea of adding to the efficiency of the engine. This invention is a very hopeful one, as it taps a source of power which is absolutely costless, and is illimitable in quantity.

WIND AND WEATHER.

It seems to us a remarkable circumstance that animals are able to live and thrive at the bottom of the ocean, at a depth of several miles beneath the surface. Yet it is well to consider that we ourselves are dwelling at the bottom of a much deeper ocean, an ocean of air, probably not less than five hundred miles in depth, one hundred times that of the ocean of water. This atmospheric ocean has certain important peculiarities. While the oceanic water currents reach to no great depth and storm-waves are confined to the surface, the currents of the aerial ocean reach to its lowest depths, and its storm-waves sweep the surface of the earth. This fact is of very great importance to us, for without it the land surface would be a very undesirable place of habitation, if, indeed, any of the higher forms of life could exist in a sluggish or torpid atmosphere.

These air currents or winds are due to a variety of causes. The atmosphere, while composed of about 70 per cent. of nitrogen and 30 per cent. of oxygen, with a minute proportion of carbonic acid gas, also holds a variable quantity of water vapor, the latter being one of the most effective agents in causing the movements of the air known as winds and storms. The tendency of this vapor to rise when heated, and carry the air with it, is a prolific source of air movements, the surrounding air flowing freely in to fill the partial vacuum. If the latter is strongly marked or covers a wide area, the resulting movement of the air will be decided, and may be felt for many miles from the centre of influence. The other winds of the lower atmosphere are very largely due to variation of temperature, arising from difference of latitude, propinquity of land and ocean areas, and other causes.

Trade-Winds.

Winds are usually classed in three divisions, permanent, periodical, and variable. The first of these—air currents which move steadily in fixed directions the year round—

are known as Trade-Winds, their cause being the constant upflow of heated air in the tropics and the equally constant inflow of air from the temperate zones to fill the rarefied air space. If the earth were at rest these winds would move directly southward in the northern hemisphere and northward in the southern, but the daily rotation of the globe changes their direction. This rotation causes any point on the equator to move at the rate of about 1,000 miles an hour, or 17 miles a minute, while points on the pole simply turn without changing place. Points between the poles and the equator move with intermediate speed, the speed at 60° latitude being about 8½ miles. Thus, as the winds blow towards the equator, they constantly enter regions of more rapid motion, and the moving air lags behind, seeming to come from the east. This is due to the fact that the earth turns eastwardly, so the trades form north-easterly winds in the northern hemisphere and south-easterly winds in the southern. The north and south trades do not meet, there being an equatorial region of calms four or five degrees wide between them. This region is the seat of frequent thunder-storms and violent downpours of rain. The declination of the sun to north or south as the season advances causes a variation in the position of the trade-winds, and from this cause in some localities they become periodical, blowing one half the year in one direction and the other half in the opposite direction. These winds, blowing over the Indian Ocean and Southeastern Asia, are called Monsoons.

Anti-trade and Periodical Winds.

While the heated air ascends in the tropics, and the colder air rushes in to take its place, the ascending air, in its turn, flows towards the poles in the upper atmosphere, forming what are known as the anti-trade winds. These slowly descend, reaching the surface in about 25° to 35° of latitude, where they take the place of the lower air that is drawn by the trades towards the equator. Here they form westerly winds, their direction being opposite to that of the trades.

Periodical winds are usually due to the counter influence of temperature over land and sea, producing the air movements known as land and sea breezes.

The origin and nature of these are easily explained. The temperature of the sea varies much less during the day than the temperature of the land. Thus, during the heat of the day the sea is cooler than the land; at night the sea is warmer than the land. Hence, in the day time, the air flows in from the sea to supply the place of the air which rises from above the heated land, while at night the heavier air over the cooled land flows towards the sea. When the land is hottest the sea breeze flows with the greatest force, and the land breeze gains its greatest strength during the coldest part of the night.

Variable winds are due to numerous local causes, such as the general configuration of the surface, the counter influences of hills, plains, and valleys, the increase of moisture over lakes and streams, the development of fogs and clouds, and the fall of rain and snow, all of which seem to affect the volume of the atmosphere in local regions and to cause movements of the adjoining air. We need scarcely say that rain and snow are the more or less immediate results of the distribution of moist air by the winds, and of the variation in density caused by the meeting of currents of air of different temperatures.

The Cyclone or Storm Wind.

The above are the more ordinary conditions of atmospheric disturbance, but occasionally special and much more vigorous causes operate, producing those violent movements of the air known as storms, or more distinctively as cyclones and tornadoes. Other names that have been given them are hurricanes, typhoons, etc. The cyclone is a vast circular storm, seldom less than 600 miles in diameter and occasionally extending over a width of more than 3,000 miles, and is marked by winds which are often of destructive violence as the centre of the disturbance is approached. It usually is the result of a rarefaction of the atmosphere extreme in intensity or widespread in area.

Commencing with an inrush of air from all sides towards a central region of rarefaction, it is easily seen that a rotary motion must needs be communicated to the resulting atmospheric disturbance. For, if we consider a definite region in the northern hemisphere towards which air is rushing from all sides, we see that the air coming from the north would be deflected towards the west before reaching the centre of disturbance, while the air coming from the south would be deflected towards the east. And all the air-currents with northing would exhibit a westerly displacement of greater or less extent, while all the air currents with southing would exhibit an easterly deflection. Thus the region of air would be moved by westerly forces in its northern half, and by easterly forces in its southern half, and so would exhibit a rotation opposite to that of the hands of a watch placed face upwards on a map of the region. Throughout the progress of a hurricane in northern latitudes, this form of rotation is exhibited. On the other hand, in southern latitudes the rotation is in the reverse direction.

Origin and Paths of Cyclones.

Cyclones exhibit a motion of translation, sometimes very rapid, which carries them from the equator first westwards, and afterwards eastwards, along paths corresponding closely with the course of the principal oceanic currents. Those which visit the United States have two general localities of origin. The greater number of them arise in the great plains west of the Mississippi River, and move northeastwardly, frequently following the line of the Great Lakes and passing out to sea by way of the Gulf of St. Lawrence. Less frequent, but much more violent, are those of tropical origin, arising in or eastward of the region of the West Indies, and entering the States from this region or that of the Gulf of Mexico. Sometimes their journey north takes place far out to sea, causing the well-known hurricanes of the Atlantic. Others follow the coast, and occasionally with a very disastrous effect. Still others take an inland course, one of the most violent on record of the latter being that which visited Galveston in the autumn of 1900 and almost swept that flourishing city from the face of the earth.

The circular or spiral whirl of the winds in a cyclone may be readily observed. The centre of the storm is sometimes nearly stationary, at others moves with varying speed, of from 10 to 50, or, in extreme cases, 70 miles an hour. As the storm approaches, moving north, if we are in or near its central line of passage, winds setting westerly will first be felt. These increase in violence as the centre draws near, and are usually attended by heavy rains. When the centre comes over us the winds fall; a temporary lull succeeds; the clouds are apt to break and the sun to appear. But as the storm moves onward the rains begin again, while the winds set to the east, at first blowing violently, but gradually declining in force as the storm passes farther to the north. The cyclone is frequently attended with hail or thunder storms, and one of its characteristic features in the West is the terrible tornado.

The Anti-Cyclone.

Opposite in origin and character to the cyclone is the anti-cyclone. As the cyclone is due to an upflow of warm, humid air, and is marked by a considerable, sometimes an extreme, fall of the barometer, the anti-cyclone is due to a downflow of dry cold air, increasing the surface pressure and causing the mercury to rise in the barometer. The winds resulting are opposite in character to those of the cyclone, flowing outward from a centre of condensed air instead of inward to a centre of rarified air. The attendant weather is dry, clear, and cold, the cold wave being one of its ordinary results. The force of the winds is never so great as in the case of the cyclone. There is probably a close connection between these two forms of storm. As we have seen, there is an uprush of air in the cyclonic centre. This, on reaching the upper atmosphere, spreads horizontally outward, and may cause increased pressure in some distant region. The result will be a condensation and overweighting of the upper air, which in consequence sinks downward, cold and dry, from

its elevated place of origin, and subsequently flows outward in all directions as the dry anti-cyclone.

The Tornado.

There is another and the most violent of all storms still to be considered, the one known by the name of tornado in the United States, of typhoon in the Eastern seas, and elsewhere as the whirlwind, the sand-storm, the water-spout, and by other names. The tornado seems to be a secondary and local result of the cyclone, the outcome of some special and extreme disturbance of the air currents. In the cyclone the winds move mainly in a horizontal direction, and cover an extensive area. In the tornado the air movement is mainly vertical and the area covered very small. It is a gyration or spiral whirl upwards, into which the air is drawn with extraordinary violence. The tornado forms the extreme development of the air whirl, which may be traced downward through a series of less violent gyrations to the little dust whirl which is so common an incident in our streets in windy weather. Various theories to account for it have been offered, but it is probably the result of the meeting of two opposite currents of air, whose checked motion is converted into a spiral whirl. The traveling motion of the tornado may be due to the meeting of the fronts of two winds at an angle, so that the point of contact travels rapidly along the front.

Tornadoes are more frequent and violent in the United States than elsewhere, their special location being the great plain of the valley of the Mississippi, where severe examples often occur, causing great loss in life and property. They appear to originate in the clouds not far above the earth, and present the appearance of vast cloud funnels, with narrow flexible ends that descend to the surface, destroying everything in their path. Fortunately their track is very narrow, less than a quarter-mile wide on an average, while the bottom of the dangling, whip-like cloud occasionally lifts and leaves broad spaces unharmed. The greatest violence is in the centre of the whirl, in which everything touched is destroyed; houses being unroofed, lifted bodily, or torn to pieces and their fragments thrown long distances; great trees torn from the ground or twisted off like reeds; such weights as locomotives lifted bodily and hurled aside, and enormous power displayed in other directions. The wind pressure of a tornado has been estimated from its effects to vary from 18 to 112 pounds to the square foot and the wind sometimes to attain the enormous velocity of 2,000 miles an hour. The time of passage of a tornado over any spot is less than a minute, sometimes only a few seconds, it striking like a gigantic hammer which instantly destroys whatever it touches. Its whirling motion is clearly indicated in the twisting of trees and the turning round of houses which have been lifted from their foundations. In the United States several thousand persons have been killed by these storms and the loss of property has reached scores of millions of dollars. The most remarkable series of tornadoes on record was that of February 9, 1884, when more than 60 occurred between the Mississippi and the Appalachian Mountains, there being in all more than 10,000 buildings destroyed, 800 persons killed, and 2,500 wounded.

Aerial Vapor and Rain.

The movements of the winds of which we have spoken produce a result of high importance in the wide distribution of the vapor of water, which the heat of the sun is constantly raising from the surface of the seas. This is carried by the winds widely over the land surface of the earth, condenses in the air into clouds at various altitudes, from the fog that rests upon the surface to the feathery cirrus that floats at a height of many miles, and falls as rain or snow from the dense, dark nimbus, or rain-cloud. The humidity of the air in any region, and its consequent degree of rainfall, are governed by the direction and force of the prevailing winds and the configuration of the surface. The winds which bring strong rains are those which have blown over a broad reach of ocean. Those whose path is over the land, like the northwest winter winds of the eastern United States, bring sunshine and dry air in their track. Mountain ranges which the vapor-bearing winds must cross are great rain-producers,

their effect being to cause condensation of vapor and rainfall. Thus the greatest rainfalls are those which come from winds which have crossed a broad ocean area, and afterwards blow up against and over a high mountain ridge lying in their path; especially if they pass from warmer into colder regions—since cold condenses the moisture of warm winds into clouds and rain. Beyond the mountains the rainfall grows less, the air having been robbed of much of its moisture, and where the various causes leading to a diminution of the rainfall reach their extreme phase, deserts appear, the clouds failing to yield the water necessary to support animal or vegetable life.

Regions of Great Rainfall.

The heaviest annual rainfall on the globe is due to the southwest monsoon, as it carries the vapor gathered from the tropical Indian Ocean over the peninsulas of southern Asia. At points in India the rainfall is enormous, reaching at Banca 251 inches, and at Mahabalishwar 263 inches of annual depth. It is also great in Burma, varying in different localities from 100 to over 200 inches annually. In desert regions, on the contrary, the rainfall almost disappears. At San Diego, on the seaboard of Lower California, the annual fall is only 10 inches, while inland it grows less, and the interior basin of Arizona, Nevada, and Southern Utah is a desert in almost as full a sense as the Sahara, its rainfall ranging from 3 to 17 inches annually. For short periods, the heaviest rainfalls are those which occur with thunderstorms and tornadoes, or in the famous "cloud burst," when the rain falls for short intervals at the rate of 5 or 6 inches or more per hour. In the United States a day's rainfall of from 5 to 7 inches has been repeatedly recorded, and as high a fall as 13 inches has been reached. These amounts have been greatly exceeded in tropical latitudes. At Bombay 24 inches have fallen in one night, and on Khasi Hills, India, on one occasion, 30 inches fell on each of five successive days.

Temperature and Atmospheric Pressure.

All the influences above named have their direct effect upon the weather at any locality, while another of its important characteristics is that of temperature, which varies greatly in different localities, its changes being due not alone to latitude and the varying power of solar heat, but to elevation, to the direction of the winds, to the influence of such heated ocean currents as the Gulf Stream, and to various other causes. The mean temperature of the northern hemisphere is given by Dove at 60° F., and of the southern at 56°, while the extremes for the globe, taking the annual means, are 80° F. and zero. If we take the monthly mean averages, the extremes on record are 110° F. for parts of India, and the very low mean of —61.2° F. for Verkhayausk, Siberia. The latter place has given the lowest reading of the thermometer on record, —88.8° F. The highest readings are questionable; 125° F. is not uncommon, and various higher readings have been made, but under somewhat doubtful conditions.

The Use of the Barometer.

As regards the pressure of the atmosphere, it varies daily for every locality, the height of the mercury in the barometer moving through a range of about four inches. These changes in barometric readings are very significant indications of coming changes in the weather, and the barometer is in constant use by weather observers as perhaps their most important instrument of observation. The usual range of height in the barometer is confined within an inch or two, but it becomes much greater during marked weather changes. The lowest, sea-level, marking yet observed was 27.333 inches, at Ochtertyre, Scotland, and the highest 31.360 at Barnavl, Siberia, but such extremes as these are of rare occurrence. The usual mean height is a little below 30 inches. It should be said, further, that the height of the mercury in the barometer decreases steadily as higher elevations are reached, so that this instrument is of great utility in determining height of mountains.

The ordinary use of the barometer is as a "weather glass." Generally speaking, a falling barometer indicates rain; a rising barometer, fair weather; a steady barometer, a continuance of the prevailing weather. When the mercury is low the

weather is generally broken or stormy; when high, it is fair. A sudden fall indicates a storm, whose violence is in proportion to the degree of fall. An unsteady barometer indicates unsettled weather, while gradual changes point to some fixed weather condition, whether foul or fair. The causes of these changes are not very well understood, though it may be said that, as moist air is lighter than dry air, the barometer will read low whenever drier air is replaced by humidity. Warm air is also lighter than cold air, and the barometer must change when these replace each other. The upflow of air in or near a storm centre, causing a rarefaction and decrease of weight, is naturally attended by a barometric fall, while the downflow and condensation in the anticyclone centre has the opposite effect of a barometric rise. Elaborate codes of rules have been drawn up to serve as a key to the fluctuations of the barometer, but as these are not greatly to be depended upon, there is no occasion to give them here.

Weather Observations.

Systematic observations of weather changes have been made by individuals for many years, both in Europe and the United States, and numerous records of their results are in existence. Of recent years the United States has taken the lead in weather observation. Benjamin Franklin was one of the earliest to observe the movement of storms, and Thomas Jefferson made arrangements for systematic observations at several points in Virginia. It remained for Joseph Henry, after the founding of the Smithsonian Institution, to organize a system of simultaneous observations over the whole United States, and these were continued for more than forty years, yielding a large amount of tabulated information concerning American meteorology, of which several volumes have been published. These form the basis of the science of the weather in the United States, and have been of the utmost service to later observers. The invention of the telegraph proved of the greatest aid in the daily gathering of these widely scattered facts, and Professor Henry began after 1850 to display daily upon a map, by moveable symbols, the state of the weather at various points in the United States. This proved of much interest, but it was brought to an end by the Civil War.

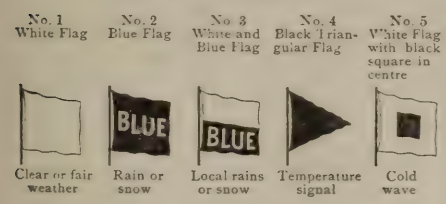
The systematic observations of Henry, Maury, and others antedated any similar systematic work in Europe, and gave the suggestion to England and France to institute systems of weather service under government auspices. In 1861 Fitzroy started the English system of weather forecasts, and Leverrier, at Paris, began to issue the French weather maps in 1863. Other countries instituted similar systems at later dates. In 1869 the intermitted work of Professor Henry was taken up by Cleveland Abbe, director of the Cincinnati Observatory, his data being collected by the Western Union Telegraph Company, free of charge, while the maps were drawn by Professor Abbe in the telegraph office, and locally distributed. His work excited so much interest that an Act of Congress was passed in 1870, requiring the War Department to undertake a similar work for the whole country. This duty was intrusted to the chief signal officer of the army, General A. J. Myer, who at once called Professor Abbe to his assistance, rapidly organized his work, and began to issue weather bulletins and storm warnings in November, 1870.

General Myer issued his daily bulletins as probable weather conditions, and soon became known as "Old Probabilities," but they were marked by so great a percentage of correctness that much confidence was placed in them. He died in 1880 and was succeeded by General W. B. Hazen, who superintended the service for seven years. His successor was General A. W. Greeley, of Arctic exploration fame. In 1891 the weather service was transferred from the War to the Agricultural Department, in which it was made a Weather Bureau under the charge of Professor Mark W. Harrington, who was succeeded in 1895 by Willis L. Moore. The forecasts of the Bureau have so improved with time that they are widely relied upon, nine out of ten proving true. There are considerably over a hundred telegraph stations in the United States, thirty stations of exchange with other countries, and State services in nearly every

State in the Union, with reports from over 2,500 voluntary reporters. More than 200 stations report floods and other river data, 1,700 stations show weather and temperature signals, while about 200 stations display storm signals, and 500 show frost signals. Forecasts are made and weather-maps published in over 100 stations, the total number of weather-maps issued annually being about 2,500,000. The Canadian Weather Service co-operates freely with that of the United States, to the benefit of both, and it is being extended to Cuba and Porto Rico, so as to cover as wide an area of the earth's surface as can conveniently be controlled.

Twice each day, morning and evening, the observers note simultaneously the weather conditions at their stations, such as temperature, barometric reading, humidity, force and direction of the wind, cloudiness, etc., telegraphing the results in cipher to Washington. These daily results are carefully studied at each station, with aid from Washington, and the probabilities of the weather for the succeeding 24 or 36 hours are publicly announced, the forecasts being widely disseminated by the newspapers and otherwise. The weather-map is daily posted in thousands of places soon after it is printed, and in the country and on the coast signals are displayed for the benefit of farmers at a distance or of ships within sight of land.

Weather Signals.



On March 1, 1887, a new system of weather signals was introduced by the United States Signal Office of the War Department. This is still in use, with such additions as experience has dictated. These signals are given by flags or steam-whistles, the flags being five in number, and of the form given above.

When number 4 is placed above number 1, 2, or 3, it indicates warmer; when below, colder; when not displayed, the temperature is expected to remain about stationary. During the late Spring and early Fall the cold-wave flag is also used as a frost-warning flag to indicate anticipated frosts.

When displayed on poles, the signals should be arranged to read downward; when displayed from horizontal supports, a small streamer should be attached to indicate the point from which the signals are to be read.

Whistle Signals.

The warning signal, to attract attention, will be a long blast of from fifteen to twenty seconds' duration. After the warning signal has been sounded, long blasts (of from four to six seconds' duration) refer to weather, and short blasts (of from one to three seconds duration) refer to temperature; those for weather to be sounded first.

Blasts.	Indicate.
One long	Fair weather.
Two long	Rain or snow.
Three long	Local rain or snow.
One short	Lower temperature.
Two short	Higher temperature.
Three short	Cold wave.

By repeating each combination a few times, with an interval of ten seconds between, possibilities of error in reading the signals will be avoided, such as may arise from variable winds or failure to hear the warning signal.

In addition to the signals indicating ordinary weather changes, there is a series of signals specially adapted for storms, giving information regarding the winds and other particulars.

Storm Signals.

A red flag with a black centre indicates that a storm of marked violence is expected.

The pennants displayed with the flags indicate the direction of the wind; red, easterly (from northeast to south); white, westerly (from southwest to north). The pennant above the flag indicates that the wind is expected to blow from the northerly quadrants; below, from the southerly quadrants.

By night a red light indicates easterly winds, and a white light above a red light westerly winds.

Information Signal.

Red or white pennant displayed alone. When displayed at stations on the Great Lakes this indicates that winds are expected which may prove dangerous to tows and smaller classes of vessels, the red pennant indicating easterly and the white pennant westerly winds.

When displayed at stations on the Atlantic, Pacific and Gulf coasts it indicates that the local observer has received information from the Central Office of a storm covering a limited area, dangerous

...ave to assess most to aid in certain points and serves as a preliminary and preparatory warning, will be given three hours before the real hurricane. Only the red pennant is displayed on the masts. No night information or hurricane signals are displayed.

Hurricane Signal.

Two red flags with black centres, displayed one above the other, indicate the imminence or actual occurrence, and that all those interested should take all necessary steps which circumstances may render necessary for the protection of life and property.

In this connection the following table may be of interest:

STANDARD TABLE SHOWING VELOCITY AND FORCE OF WINDS.

Designation	Miles per Hour	Feet per Second	Pressure per Square Foot	General Description
Hurricane	1	88	1.67	very
Fast Hurricane	2	176	6.68	very
Storm	3	264	14.8	very
Violent Storm	4	352	26.7	very
Furious Storm	5	440	41.7	very
Gale	6	528	60.0	very
Strong Gale	7	616	81.7	very
High Wind	8	704	106.8	very
Very High Wind	9	792	135.2	very
Storm	10	880	167.0	very
Great Storm	11	968	202.1	very
Hurricane	12	1056	240.5	very

The average hourly velocity of winds in the United States varies for different localities from 6 to 14 miles per hour. The highest velocity on record for a period of five minutes was 96 miles per hour, at Denver, Colorado, and North Platte, Nebraska. The velocity during the tornado in Minnesota, June, 1905, may have surpassed this, but the wrecking of the instruments prevented its ever being observed.

In addition to the general rules for interpreting the weather from the readings of the barometer already given, the following more detailed rules, adapted for use with the aneroid barometer, but applicable to the mercury barometer, may be of service:

A Rising Barometer.

A rapid rise indicates unsettled weather.

A gradual rise indicates settled weather.

A rise with dry air and cold increasing in Summer indicates wind from the northward; and if rain has fallen, better weather may be expected.

A rise with moist air and low temperature indicates wind and rain from the northeast.

A rise with southerly winds indicates fine weather.

A Steady Barometer.

With dry air and seasonable temperature this indicates a continuance of fair fine weather.

A Falling Barometer.

A rapid fall indicates stormy weather.

A rapid fall with westerly wind indicates stormy weather from the southward.

A fall with a northerly wind indicates storm, with rain and hail in Summer and snow in Winter.

A fall with increased moisture in the air, and heat increasing indicates wind and rain from the southward.

A fall with dry air and cold increasing in Winter indicates snow.

A fall after very calm and warm weather indicates rain with possibly thunder.

The indications given for northerly winds, including those modified by winds to the eastward for dry, or less wet, weather, for less wind, or for more than one of these changes, except in a few occasions, when rain, hail, or snow comes from the northward with strong wind.

The barometer falls for southerly wind, including those modified by winds to the westward, for wet weather, for stronger wind, or for more than one of these changes, except on a few occasions when moderate wind, with rain or snow, comes from the northward.

LATEST SCIENTIFIC DISCOVERIES AND INVENTIONS

During the closing decade of the nineteenth century science and invention by no means stood still. On the contrary, they advanced with accelerated rapidity, moving by bounds rather than by steps, with the result that, in this brief period, a considerable number of striking and remarkable achievements took place. And the twentieth century, young as it still is, has already added its share to these discoveries, and promises to be yet more active in the service of man than its predecessor has been. Our knowledge of nature is still far from complete. Our utilization of the forces of nature, great as it has been, may still be largely added to. And when it is considered that the number of nature students has enormously increased within the past hundred years, that the instruments of research have been greatly developed, that science and mechanics are taught in hundreds of well-equipped institutions, that the pioneer work has been completed and we are now dealing with the advanced results, it becomes evident that the opportunity and equipment for new discovery is very much greater than it was a century ago and that we may hope for achievements still more wonderful than those of the past. With this preliminary statement we shall proceed to review some of the most important results reached during the past decade. Many of these, as might be expected, relate to electricity, the wonder-worker of the age, and these we shall first consider.

The Telautograph.

Telegraphy, while still largely confined to sound signals, has developed in various other directions. For instance, a number of printing telegraphs have been devised, by which messages are printed in plain English text with great rapidity. They are transmitted by an automatic machine, which can send and print about two hundred words a minute. But a paper tape, with holes punched through it to represent the letters, has to be prepared for each message, and the time gained in sending is lost in punching. A printing telegraphic system recently invented in Austria is claimed to be far more rapid in operation than is above stated, but it also has the defect of losing time in preparing the tape message for transmission.

The Telautograph, invented by the late Prof. Elisha Gray, and first shown at the Chicago Exposition of 1893, is an interesting invention in this direction. By this instrument ordinary handwriting can be sent in exact *fac-simile*, drawings transmitted, etc. The message is written on paper with a pencil to which two silk cords are attached. As these follow the movements of the pencil, they send electric impulses through the wire, and a glass pen at the receiving end duplicates the pencil in its motions, reproducing the message in exact correspondence with the hand of the writer. This interesting invention has not yet come into practical use. Four wires were at first necessary. These were reduced to two in 1897, but the instrument still awaits a cheapening process.

Telegraphing from Trains.

It it easy now to send a telegraph message from a railroad train moving at full speed. This is performed on the principle of electric induction. A telegraph wire is laid between or alongside the rails, so as to bring it near the car. A magneto-telephone apparatus is then placed in connection with metallic roof of the car, and a pipe or other conductor low down under the car-body. With ordinary Morse instruments on the car a message can be sent, being taken up by induction, and following the ground wire to a station. But the system is expensive, on account of the difficulty of insulating a wire on the ground level, and there is not enough business for such a system to make it pay. Therefore it has not been introduced.

Wireless Telegraphy.

Of the highly important recent system of sending telegraphic messages without the aid of conducting wires mention has been made in a preceding chapter. But, as this system has been developed within the past decade, and as it is one of the leading discoveries of the age, a fuller account of it seems necessary at this place.

The wireless telegraph is usually associated with the name of Guglielmo Marconi, an Italian inventor, who has been working upon it since 1896. But the principle was of earlier development, his merit being confined to his method of operation. In 1893 messages were sent a distance of three miles to an island in the British Channel, and somewhat later to a distance of four and one-half miles. But in those experiments and earlier ones, the principle of induction was utilized between wires laid along the water's edge on each side, and this principle was not capable of being greatly developed.

The use of what are known as the Hertzian waves, flowing from powerful charges of electricity, was adopted in 1895, by Dr. J. C. Bose, a Hindu physician of Calcutta, who telegraphed by their aid from one room to another seventy-five yards away, through three brick walls. Others tried the same method, among them Marconi, who, while experimenting with the Hertzian waves in 1896, sending them to a receiver a mile away, was surprised to find that he was affecting another receiver at the same distance, though a hill three-quarters of a mile thick lay between. The waves seemed to pass out in all directions from the transmitting instrument, and could be picked up by any number of suitable receivers in a circle around their sphere of action. The value of Marconi's experiments lay in his special receiver, in which was a glass tube containing finely-divided metallic particles. The action of electricity caused these to cohere so that a local current could pass easily through them. When once brought together they continued to cohere and the current to pass. To break this coherence and check the current Marconi devised a tapper—a very light hammer worked by the current, which struck the tube lightly after each electric action and caused the fine grains of metal to fall apart. Thus there was a rapid making and breaking of the circuit as each wave of electricity passed, and it became easy to receive the electric waves which flowed out in all directions from the transmitter.

By the use of this device, and suitable apparatus, Marconi rapidly increased the range of his messages from one mile to nearly a hundred miles, and became hopeful that in brief time he would be able to telegraph from London to New York. But it seemed necessary to use lofty masts for transmitter and receiver alike. In his early experiments in England he used a mast 177 feet high to send a message thirty miles. This seemed a serious difficulty in the development of his system, but, fortunately, the use of the tall mast now seems to be unnecessary, since he has succeeded in telegraphing sixty miles with the receiver only four feet from the ground.

A second difficulty was the fact that the messages sent lacked the element of privacy, as they could be picked up at a distance of many miles in every direction, and might be read by enemies as well as friends. Even if a cipher was used, this would not be a safe device, as ciphers can be somewhat easily read. This difficulty Marconi claims to have overcome, by a system of "tuning" his instruments to each other, so that only a receiver in harmony with the transmitter will be affected by the message. He is said to have sent messages a distance of thirty miles, each of which was taken up only by the receiver in sympathy with its transmitter. Other messages sent at the same time from discordant transmitters were not received and did not interfere with the reception of the one in harmony. The instruments used in this experiment were only twenty-five or thirty feet above the ground.

All this seems to indicate a wonderful future for wireless telegraphy. It is in its infancy as yet, and the years to come may develop it to an extent and in ways of which we scarcely dream, making it of untold value to mankind.

The Telephone Gazette.

Passing now from the telegraph to the telephone, it may be of interest to describe a highly interesting development of the latter wonderful instrument. Edward Bellamy, in his famous novel entitled "Looking Backward," describes a newspaper of a new kind, a spoken instead of a written paper. By the aid of telephone connections, the events of the day in all parts of the world are to be "phoned" to subscribers in their

homes, while great orations, theatrical entertainments, concerts, etc., may be enjoyed by people without leaving their rooms.

This wonderful paper is to appear late in the twentieth century. Bellamy did not dream that there would be such a paper in existence within less than ten years after his book was published. Yet, for a number of years past there has been such a spoken newspaper in active operation, the *Telephone Gazette*, of Budapest, Hungary. This singular concern has a corps of some forty reporters and literary men engaged in collecting and preparing news, which is sent every day and all day long to clubs, restaurants, public buildings, hotels, and private residences, the hours of publication beginning at 8.30 A. M., and continuing without interruption till 11 P. M. Each hour is devoted to some special class of news, so that the subscribers, whose numbers are constantly increasing, know at any hour what kind of information they will hear by putting their telephone receivers to their ears.

Beginning with the telegraphic news from abroad, it follows with local and provincial news, etc. At 8 o'clock in the evening begins a series of concerts, lectures, recitations, and other forms of instruction and entertainment. The senders are men of clear and distinct enunciation, there being a number of them, so that they may relieve one another at suitable periods. It might be imagined that such an enterprise as this would not succeed, yet the *Telephone Gazette* has become one of the established institutions of Budapest. It is one of the most remarkable developments of the recent century.

Long-Distance Telephony.

It has long been a desirable thing to extend the distance to which people could talk over the telephone wire. Beginning with a few miles of city streets, the wires were gradually extended to neighboring towns, to cities in the same section of the country, and so on, until Chicago was reached from New York, and greater distances were reached. The best that can now be done with land wires is to talk from Boston to Omaha, half-way across the continent, while under the sea the longest available distance is across the English Channel, by a wire which connects London with Paris.

The longer the distance the thicker the wire must be. For local service a copper wire weighing 120 pounds to the mile will serve, while the long-distance wire must weigh 425 pounds to the mile. By the use of "repeaters," it is very easy to telegraph from New York to San Francisco, but no telephone repeater has been invented, and the weight of copper wire needed for such a distance would be prohibitive.

In this dilemma a new invention has come forward which promises to overcome the difficulty and enable men to talk with each other across the continent by the aid of the ordinary telegraph wire, and even under the ocean. This is the production of Professor Michael Pupin, of Columbia University, who has recently perfected it after several years of experiment.

The purpose of this invention is to overcome the resistance to the passage of the current. To do this Prof. Pupin cuts the wire or cable at fixed intervals and introduces a well-known electrical device called a "choke coil." This consists of a little wire wound into the form of a hollow spool, and overlaid with some more wire. Such a coil, introduced into a wire at the intervals in which the electric wave reaches its nodal points, has the property of strengthening the wave. If we shake a long rope, for instance, a wave will run along its length, with nodes, or points of rest, at certain intervals. These are well defined near the hand, but at a distance they become confused and lose their clear definition. If now weights be attached at the intervals where these nodes occur, and the rope be again skaken, the wave will be found to run clearly to the end, the weights aiding in its movement. In Prof. Pupin's invention, the coils serve the same purpose, stimulating the electric wave, and enabling it to overcome the obstacle of inductive resistance. By a careful mathematical analysis, that took him several years, he calculated the exact spots in which the coils should be placed. Then, by practical experiment, he proved the truth of his calculations.

It is claimed that this valuable invention will be useful in enabling telephone messages to be sent under the ocean as well as over the land. The difficulty of submarine telephoning is that the electric waves emanating from the telephone used by the speaker move faster over the first part of the cable than they do towards the last. Thus the first waves are overtaken by subsequent waves while the first are still in the cable, producing a chaotic jumble by the time they reach the other side.

This phenomenon is caused by the fact that the first pulsation or signal which is let into the cable fills the capacity of the conductor so that each subsequent signal must, before it can get through, displace a certain amount of electrical fluid equal to that let in by the fresh signal.

For example, if a vessel is filled with water and it is desired to pour in another pint of fluid, a pint of the original contents must be forced out before the new pint can be accommodated. It is the necessity of forcing a way through the cable when already charged to its capacity that retards the speed of new signals, and makes it necessary to wait until each wave has registered before letting in another.

To overcome this condition, Prof. Pupin proposes to place on the cable his newly-constructed coil, one to each eighth of a mile, the capacity of which will be equal to the interval between coils, so that when the cable is charged by the first signal, the numerous coils take up the charge already in the conductor, and by relieving the cable permit the electrical waves to flow with less resistance.

The inventor also claims that the coil will, in relieving the capacity of the submarine telegraphic cables, enable the operator to send 500 times as many words as can be sent under present conditions.

The first application of the system, however, will probably be to land lines. It ought to be an easy matter to extend these across the continent, or for a much greater distance. Great economies in the use of metal will also be secured on circuits of a few hundred miles as well as on circuits of much longer distances.

Electric Telpherage.

The trolley system of car propulsion is extended, in the system called telpherage, to include general transportation. This is a system of aerial electric transportation by means of rope, cable or wire, useful in mining or other districts where railroads cannot be easily built, and where there are heavy weights to carry. It is a very cheap form of transportation, the line costing little, and crossing with ease all inequalities of ground which would prove serious obstacles to surface carriage. On these wires may be conveyed heavy timbers from a lumber camp, ore from a mine, etc.

There are two systems of telpherage. In one there is a stationary fixed rope or cable, on which the carriers or hangers run along by small pulley-wheels. In the other and more common an endless wire rope is moved by a stationary source of power, the carriers and their loads moving with it.

In electric telpherage the carriers possess their own source of power, small electric motors running on the wire, from which they take the current that sets them in motion. Where there is water-power to run a dynamo, this system is cheap and useful, but so far it has been little employed.

Storage Batteries.

The electric storage battery is no new invention. It has been for years in use to some extent, and has been much improved upon. But it seems destined to come into play in a new and very useful way of which something may here be said. In many sources of power there is a great waste, which little has been done to overcome. Let us consider the very irregular windmill, which depends on the variable movements of the air, and whose action is so uncertain that it can be employed only in pumping or other duties of secondary importance. The same variability is likely to appear in the solar motor, when it comes more fully into use; and it renders the tidal motor almost useless. Water-power, too, often runs to waste, especially at night, when mills and factories are at rest.

In these and other sources of power there is often a large waste of energy which

it is desirable to have stored up until wanted. The most available way of doing this is by use of the electric storage battery. The unused power can be set at work storing electric energy at such intervals, and this energy be afterwards put at useful labor. Little has so far been done in this direction, but much may be done in the future. Man will not sit down content forever and see useful power wasted at his elbow, exerting its strength idly on the air.

The Electric Furnace.

One of the most important of recent devices is the electric furnace, an apparatus for utilizing the intense heat of the electric glow. In this the principles of incandescence and of the arc light are both employed, the latter most commonly. The heat of the electric arc is enormous, the temperature reached being far higher than can be attained in any other form of furnace, so that the most refractory substances may be fused. In the ordinary arc light the heat ranges from about 4,000° F. at the tip of the cone to 6,000° in its central portion. It is from this intensely hot centre, not more than the tenth of an inch square, that the most brilliant glow emanates. Few substances can pass through this heat without melting or volatilizing. Iron melts at 3,000° F.; platinum at 3,500° F.; both quickly flow in the electric furnace, while rocks and clay are easily fused. Carbon, one of the most refractory of substances, is softened and vaporized, though it does not fuse.

In some furnaces the substance to be treated is crushed and let fall through the electric arc. The melted matter is received in a suitable vessel. In other furnaces the ore to be fused is placed between electrodes of carbon and a powerful current passed through it. In the Cowles furnace, used in the reduction of aluminium, molten copper forms an alloy with the aluminium as soon as it is separated from its ore. Among the substances which the electric furnace has yielded is carbide of calcium, a source of acetylene gas. This was formerly known, but not in commercial qualities. A completely new substance is carborundum. These two products of the furnace call for special mention.

Carborundum.

Carbon is known to form compounds with many of the metals, these being formerly called *carburets*. One of them is the carbide of iron, which gives many of their valuable properties to steel and cast-iron. New carbides have been formed in the heat of the electric furnace, the most interesting being the carbide of silicon, a compound of carbon and silicon. This was discovered about 1890 in an attempt to make artificial diamonds by sending the electric current through a mixture of carbon and clay. There appeared some bright blue crystals, hard enough to cut precious stones.

This substance was supposed to be a carbide of aluminium, but proved, when analyzed, to be a carbide of silicon. It was given the name of carborundum, and its remarkable hardness soon brought it into use as an abrasive mineral. In its powdered form it proved to be superior to emery or even diamond dust. It is now largely produced at Niagara, and is coming widely into use as a sharpening substance, being made into the form of wheels, hones, files, etc. Dental instruments are also made of it.

Carbide of Calcium and Acetylene.

Another important carbide made in the electric furnace is that of calcium. This is produced by the treatment of lime and carbon in any form—coal, peat, petroleum, charcoal, etc.—in the arc, the calcium and carbon combining at that intense heat into a solid substance of very useful properties. It is a greenish-gray, stone-like substance, not unlike serpentine rock, and with an odor resembling that of garlic.

The value of this substance was discovered by accident. Some of it was plunged into water, when a gas immediately rose, which was soon found to be an illuminant of remarkable powers. This gas was one already known as acetylene, but which had not been produced in large quantities. The carbide of calcium is found to be decomposed by the water, yielding C_2 O, or lime, and C_2 H_2, or acetylene.

Acetylene is a colorless gas which burns with a bright, smoky flame. But if it is burned in a flat-flame gas-burner it yields a light brighter than that of any other gas

known, being more than twelve times as bright as the light of ordinary coal gas. Its illuminating capacity for five cubic feet per hour is 240 candles.

Numerous efforts have been made to utilize this brilliant light-giving gas. In its most available form it is reduced to the liquid state, under a pressure of about fifty atmospheres. Cylinders of this liquid can be conveyed into stores and houses and connected with the ordinary gas-pipes. The liquid gradually evaporates and arises as gas through the pipes to the burners. Here it burns with so brilliant a glow as to throw a shadow from both the gas-flame and the incandescent electric light. Yet acetylene has not come largely into use. It will explode under certain conditions, and the risk is more than people care to take. There are also other difficulties in the way.

The Welsbach Light.

Passing from electricity to its sister element, light, several results of much interest are to be chronicled. The acetylene light and the incandescent electric light both seem to be largely set aside for ordinary purposes by the Welsbach gas light, now very widely used in houses and stores.

The principle of this light has long been known, but only of late years has it been usefully applied. It rests in the power of many refractory minerals, when raised to incandescence, to yield a glow of great brilliancy. The lime light, long used in photography and for other purposes, is an example of this principle, a piece of lime, when highly heated, yielding an intense light. Various other minerals display a similar power, and many experiments have been made with a view of employing this principle as a useful source of illumination, but success was first attained by Auer von Welsbach, a German chemist.

The principle of the Welsbach light lies in the deposition of certain very refractory minerals on a cylindrical web of woven cloth, in such quantity that when the web is burnt away the mineral matter remains as a very thin and fragile "mantle" of incandescing material. This, placed over a gas-burner, and protected by a glass chimney, is found to yield a brilliant glow of light. The minerals employed are obtained from a substance called monazite, which is a phosphate of cerium, lanthanum and other rare elements, which are among the most refractory substances known. It need scarcely be said that the Welsbach light has attained an immense popularity.

The Roentgen or X Ray.

Among recent discoveries in science, one of the most wonderful is that of a new form of light, of remarkable properties, named by its discoverer the X Ray, but often called the Roentgen Ray in honor of William O. Roentgen, the German physicist, to whom its discovery is due. This peculiar and highly interesting light is given off by a Crookes tube, which is a glass bulb from

X-RAY PHOTOGRAPH OF A HAND.

which the air has been exhausted and into which is introduced the terminals of an electric circuit. When a current is sent through this tube a bright glow of light appears, especially brilliant in the region surrounding the terminals.

The cathode rays, those emanating from the negative terminal, are thought to be streams of electrified molecules, which strike against the walls of the tube, yielding a soft

light. The Roentgen rays flow out from the tube where thus illuminated, or from a platinum plate in its interior which is similarly lit up. Their peculiar property is that they are able to pass through substances which are opaque to ordinary light, while they fail to pass through certain substances transparent to ordinary light.

There is a great difference in the transparency to these rays of different substances. Glass acts like metal; zinc is six times as permeable as platinum; leather is much more transparent than iron, so that if the rays are passed through a boot, the nails show darkly and distinctly. The most interesting fact is that the human body is permeable, the flesh being more transparent than the bones. It is this fact that lends their great utility to the Roentgen rays. When they penetrate the body, the flesh is dimly visible while the bones are clearly seen, and various details of the anatomy can be made out. Clothing does not prevent this, as it is transparent to the rays. If there be any foreign substance, as a needle, a shot or bullet, or other article, in the body, its locality can be exactly determined, and a surgical operation for its removal becomes easy. It is in the domain of surgery, therefore, that this signal discovery has so far proved useful.

Liquid Air.

There are two special ways in which air may be made serviceable: one that of rarefaction, some of whose results have just been described, the other that of compression, one result of which is the compressed-air motor, of which we have already spoken, and which promises to become among the most useful of power agents in the future. A highly important outcome of compression and refrigeration combined is liquid air, of which we have spoken, but which is of such interest as to demand a fuller treatment.

The reduction of the supposed permanent gases to the liquid, and even to the solid, state is not particularly new. From time to time one after another of these has been thus dealt with, and in 1878 the world was startled by the announcement that both oxygen and nitrogen, the principal gases of the atmosphere, had been compressed and chilled until they became liquids. The temperature of liquid oxygen was found to be —184° C. and of nitrogen —193° C.

This result was equivalent to reducing the air to the liquid state, and it was not found difficult to convert a portion of the atmosphere into a hard and intensely cold solid. All this is past history, but the important point to speak of is the fact that air can now be liquified with ease and in such large quantities that it may be used for commercial purposes, and it is proposed to use it as a power agent and as an explosive. The method by which this is done, the invention of Charles E. Tripler, of New York, is of late origin, and calls for description. The process is simple in character, and cheap and abundant in results.

The cheapness comes from the fact that the air is forced to do the work of chilling itself. In the apparatus used the air is first compressed by engine-power in a suitable receiver. Compression of the air, as is well known, produces heat, as expansion produces cold. In this case, after compression, the air cylinder is cooled again—which can be readily done with cold water. The air is then allowed to expand into a new receiver, and in doing so becomes greatly chilled. This is the first process. It is now repeated, the cold air being compressed much more than at first, the heat again carried away, and expansion again permitted. This causes the temperature to fall to a much lower degree than before. A third compression, still more severe, now takes place, after which some of the air is allowed to expand and pass around the receiver, which becomes so cold that, on opening a stop-cock, liquid air runs out like water. Thus the production of liquid air has become a mere question of engine-power, the cooling process being performed by the air itself. The liquid thus produced is a powerful refrigerant. As its nitrogen evaporates before its oxygen, these gases can be easily separated, and pure oxygen, a useful agent in the arts, may be cheaply produced.

New Gases in the Atmosphere.

A special line of research has led to the discovery of several new gases in atmospheric air. One of these, named argon, was

discovered by Lord Rayleigh and Professor Ramsay in 1895. It is somewhat heavier than nitrogen and composes nearly 1 per cent. of the atmosphere. In the same year Professor Ramsay discovered another gas, named helium, which had been previously known only in the atmosphere of the sun. It was found in a rare mineral of Norway called *cleveite*. It has since been found in other minerals, and proves to be a gas of about twice the density of hydrogen. It was reduced to the liquid state at about the same time as hydrogen.

Since then three other gases have been discovered by the study of liquid air and argon. They have been named neon, krypton, and xenon. They exist in very minute quantities, and would probably never have been known but for the liquefaction of air. These new gases have approximately the following densities: Hydrogen being 1, helium is 2, neon 10, argon 20, krypton 40, and xenon 64.

Artificial Ice.

The discovery of the art of refrigeration led to a very important application in the manufacture of ice—styled artificial in distinction to natural ice, or that produced by the processes of nature. The ice machine works on the same general principle as the liquid-air machine above described. The chilling effect is produced by the use of some volatile fluid, such as ether, ammonia, or sulphur dioxide, whose evaporation draws heat from surrounding substances, just as the expansion of compressed air does in the liquid air machine.

Anhydrous ammonia, a liquid which boils at —27° F., is usually employed. The ammonia is placed in a coil surrounding a tank containing brine, and as it evaporates it draws heat from the brine, which becomes chilled. The brine circulates around vessels containing water, which is robbed of its heat and converted into ice. In some machines brine is not used, and the ammonia extracts heat directly from the fresh water.

The ammonia can be used again and again. Escaping as a vapor, it is compressed and cooled until it becomes liquid, when it is returned to the coils, and the same process is repeated. There is but little loss of ammonia. The ice is made in cakes of considerable size, distilled water being used if intended for household use.

The Automobile.

One of the most interesting of recent developments is the sudden popularity of the motor carriage, which now divides with the bicycle the allegiance of those who prefer to travel without depending upon the horse. Motor carriages are not new. They have been invented from time to time for a century past. But the earlier ones were crude and costly vehicles, and it is only of late that cheap and satisfactory carriages, moved by their own power, have appeared. The progress of these vehicles was first made prominent by a long race of automobiles in France in 1895, followed by similar races in the United States. By the opening of the twentieth century they were becoming common on our streets, and the use of the horse seemed on the decline.

The power used in these vehicles varies in character. In some of them gasoline is used, the gas rising from it being conveyed by a small tube to the cylinders, where it comes in contact with the air, and is exploded by an electric spark or other source of heat. The gas evolved operates a small engine that turns the axle of the carriage. In others, the electric storage battery is used, and in still others steam-power is employed—gasoline being used as the fuel. The latter carriages are known as locomobiles. Examples of all these kinds of motor carriages are becoming numerous, in different styles, varying from the motor bicycle to the heavy delivery wagon.

Flying Machines.

While progress over the land is provided for in the way just described, travel through the air has set many inventors at work. As yet the problem of the flying machine has not been fairly solved, though much has been done in that direction.

Many of the experiments have been made for the purpose of producing a machine capable of flying as a bird flies through the air. Professor Langley, of the Smithsonian Institution, devised a steam-power *aerodrome*, which moved gracefully through the

air till the steam gave out. But this was a quite small affair. Lelienthal, a German experimenter, invented one that would sustain him in the air for short flights. But in one of his descents, in 1896, he came down too suddenly and was killed. Several others have made similar machines, one of the most interesting being the Maxim flying machine, which made a short flight through the air in 1894.

But hope of producing a machine of this character that will carry a man for any considerable distance safely through the air seems to be lost, and later experimenters are using some form of elongated balloon to sustain the weight of the machine, and a light engine of some kind to propel it through the air. The latest results in this direction seem hopeful, and the air may yet become one of man's favorite fields of travel.

The Submarine Boat.

There is still another field of travel which has hitherto seemed closed to man and to belong solely to the fish, the submarine realm. But man, in his restless activity, is not satisfied to be debarred from that great realm, and boats have been built which are capable of navigating the under waters of the sea.

Boats adapted to this purpose are not quite recent in origin. David Bushnell, of Connecticut, constructed one of them, called the *Turtle*, in the Revolutionary War. Its purpose was to blow up, with cans of gunpowder, the British vessels in New York harbor. Though it did not succeed in this, it could be steered and directed under water with some accuracy, and carried air enough to supply its occupant for an hour.

Since 1890 a number of submarine boats have been invented, which are capable of carrying a number of men for several hours. The problem of breathing is solved by the use of tanks of highly compressed air, which is let out gradually as needed, and is sufficient to serve several men for a considerable length of time.

Of these boats the most interesting is the Holland submarine torpedo boat, tested in New York harbor in 1896 and 1897, and subsequently accepted for naval purposes by the United States government. The first boat was named the *Holland*. A second, to be called the *Plunger*, was ordered, but was not completed. In the spring of 1901 fourteen of these boats were under contract, five of them being built for the government. The latter are to be 63 feet 4 inches long, 11 feet 9 inches wide, and 12 feet 1 inch deep, the displacement when submerged being 120 tons. When running on the surface they will be moved by gasoline engines of 160 horse-power, but under water storage batteries and electric motors will be used. They are expected to be able to journey sixty miles, with a speed of nine knots an hour on the surface and seven when submerged. Some of these vessels are to be used for submarine research, for which they may prove very useful. What value they will have as torpedo boats in the presence of a hostile fleet remains to be shown. We may hope that it will not soon need to be demonstrated.

Printing Without Ink.

We have by no means exhausted, in the above review, the discoveries and inventions of the last decade. Many others of some note might be named, though we must confine ourselves to the more important. One of these is a method of printing without ink, the invention of Mr. F. Greene, a London photographer.

He has produced a paper which can be printed upon by the use of an electric current. It is not "sensitized" in the usual manner, but the chemicals used are mixed with the pulp in the paper machine, the paper produced being colorless and stable, and unaffected by any agent but the electric current. It is printed on with an ordinary press, in which no ink is used, the current being sent through the types when at work, and yielding, where they touch the paper, a dense black, permanent impression. At an exhibition at Blackpool, England, a large company of printers and scientists witnessed the operation, a rotary press being run at the rate of 6,000 impressions per hour. The work was declared perfect in every respect.

A Movable Stairway.

A late invention, which competes with the lift or elevator, is a stairway in constant

motion, which travelers can ascend without lifting a foot. It is moved by a link belt, the steps traveling upward smoothly, and sliding closely under the floor boards at the top, to be returned out of view. The passenger needs only to set his feet upon the lower step, and will be carried swiftly and gently upward, at the rate of ninety feet a minute. On reaching the top, he steps off to the floor above. In this way three thousand passengers per hour can ascend, six or seven times as many as could be carried in a large passenger elevator. Stairways of this kind are successfully at work in some establishments, doing their service without need of the elevator boy.

Mosquitoes and Disease Germs.

It will be well to conclude this review with a statement of one of the most interesting discoveries of recent years, that of the mission of the mosquito in propagating disease. It is claimed that a certain speckled-wing species of this troublesome family of gnats becomes infested with the germs of malaria and some other diseases, and, when stinging its human victims, leaves behind not alone its own poison, but occasionally a far more dangerous venom, the bacteria of infectuous diseases.

Several experiments have been made of recent years to discover if the mosquito was justly blamed for spreading disease, the most significant being in the summer of 1900 by two scientists who spent that season in the malaria-infected Roman Campagna. Going abroad freely during the day, at night, when the mosquito was on the wing, they shut themselves up in an insect-proof hut. The result was that they escaped the disease, though it is almost or quite certain to attack any stranger who spends even a single night on the Campagna.

The result of this experiment rendered it exceedingly probable that the mosquito is the carrier of malaria—possibly not the only one, but apparently the principal and most efficient one. Still more recently this insect has been charged with the propagation of another disease, the deadly yellow-fever. An American commission, under Dr. Reed, made experiments at Havana, and announced as its conclusion that the mosquito was alone responsible for the spread of the disease. In the course of the commission's investigations six non-immune persons were infected directly by the bite of mosquitoes which had previously bitten yellow-fever patients, and five of these developed yellow-fever.

The last experiment made was held as proving conclusively the theory of propagation by mosquitoes. A special building was constructed of disinfected material, and one of the rooms was divided into two sections by a wire mosquito screen. In one section were placed disinfected bedding and clothing, and in the other bedding and clothing from the yellow-fever hospital which had not been disinfected.

Two non-immunes occupied the two sections. In the former were put several infected mosquitoes. The patient remained in this room only long enough to be bitten, and in four days a pronounced case of yellow-fever developed. The other subject slept in the infected bedding for many nights and did not contract the fever.

Both these persons slept twenty nights in garments worn by yellow-fever victims and in bedding from the yellow-fever hospital without infection, and in no instance in the course of the commission's investigations did a case of yellow-fever develop from exposure to infected bedding or clothing.

Destroying the Mosquito.

In view of the dangerous character of the disease-carrying mosquito—which fortunately seems confined to a few species—some means of eradicating this insect is desirable. But it is far less easy to get rid of the highly prolific insects than of the larger animals, and the gnats occur in such vast multitudes that they would seem to defy the efforts of their enemies. Fortunately, the mosquito spends its larval life in quiet ponds, to whose surface the larvæ must come for oxygen. It is found that a thin film of oil spread over the surface will eradicate all those existing in any body of water.

This simple fact gives us some hope. By a concerted onslaught on the mosquito larvæ it seems possible to clear any district from these dangerous insects.

BOOK III.

MECHANICS

A PRACTICAL GUIDE TO THE USE OF TOOLS, SELECTION AND PURCHASE OF MATERIALS — HELPFUL AIDS IN CARPENTRY, PLUMBING, BRICK AND STONE WORK, PAINTING, PAPER HANGING AND OTHER BUILDING TRADES—THE MANIPULATION OF ELECTRICAL APPLIANCES —WORKSHOP RECIPES AND PRACTICAL MEASUREMENTS AND ESTIMATES.

EVERY MAN HIS OWN MECHANIC

THE PRACTICAL MECHANIC

HOW TO MAKE YOUR OWN REPAIRS—HELPS IN CARPENTERING, BRICKLAYING, METAL WORKING, PAPER HANGING, AND OTHER USEFUL OCCUPATIONS—INSTALLATION OF ELECTRIC BELLS, TELEPHONES AND OTHER MECHANICAL APPLIANCES—PRACTICAL RECIPES AND DIRECTIONS.

EVERY MAN HIS OWN MECHANIC

Mend your broken chairs and crippled furniture; put fresh panes of glass into your broken windows; do your own repairs as far as it is practicable, indoors and out of doors; look after your own locks and fastenings; make your own garden tools and appliances; put up your own sheds, greenhouses, and garden buildings, and I shall answer for it that if you check what you save on each job, you will find yourself in pocket at the end of the year merely through resorting to self-help.

Let us take a simple case of common occurrence, as for example, a broken window, and see, by comparing the cost of repairs when executed by a glazier on the one hand, and done by the householder himself on the other, how much may be saved by means of a little practical knowledge and self-help.

Broken Window, How to Mend It.

We shall first look into the cost of the work when the householder is his own mechanic. The man who lays himself out to do odd jobs of this kind will of course have at hand the tools necessary for carrying out the work, namely, a hammer, a suitable knife for hacking out or cutting away the hardened putty and fragments of glass still remaining in the window frame, and a putty knife. The first thing to be done is to clear the rebate or groove in the sash-frame for the reception of the new pane The next step is to measure accurately the length and breadth of the aperture, including the rebate, and procure a piece of glass of the required size from any painter and glazier or store which cuts glass for those who may require it. A little putty must also be procured. Now, supposing, that the glass measures 18 in. by 12 in., or, in other words, contains one and a half superficial feet, the cost of the glass will be 10 cents. The cost of the putty may be reckoned at 1 cent, putty generally speaking being 5 cents per pound, though it may be frequently purchased at the paint store for 4 cents per pound. The expense, then, of putting things as they were before to the householder who can use his hands is no more than 11 or 12 cents. It will cost 25 cents or more if a journeyman is called in.

It may be argued that a man who aspires to be his own mechanic cannot possibly gain a sufficient knowledge of all or any of the various building trades to enable him to do the necessary work of construction or repairs in a workmanlike manner, and that even if he could do so he would never be able to find time enough to do all that may be wanted in house and garden from year's

end to year's end. Yet, so far as time is concerned, it may be pointed out at once that the most hard-worked man has his regular or occasional half-holiday, to say nothing of the summer evenings when there is light enough for handi-craft work even after 8 o'clock; and if these be not enough, he must—as people are often told to do who object that they can find no time for this, that, and the other—MAKE time.

Knowledge Must Be Paid For.

It is good policy, then, for every man who seeks to do a little as a handicraftsman, to lay out a few dollars in obtaining the services of any moderately skilled artisan, who, for such a sum, would willingly show the aspirant how to use his tools, and how to keep them in working order. Thus, for example, if a man desired to follow up carpentry, it will be beneficial to him in the highest degree to enlist the services of a carpenter who will show him how to use his saw and his plane, and how to keep his saw fit for use by sharpening it with a file, and his plane and other cutting tools in proper condition by means of the grindstone and oilstone. If, again, he wished to be able to build a brick wall, he should get a bricklayer to show him how to prepare his foundations with spade and level, and how to put in the footings of his wall, and to raise it, course after course, so that its faces within and without, may be truly perpendicular, inclining neither to the one side nor the other. Having once learned *how* to do a thing, a fairly intelligent man will not require so very much practice to enable him to do such work as inclination or necessity may suggest, in a tolerably workmanlike manner.

Carpentry Most Desirable.

If it be asked what branch of handicraft trade, or, to bring matters within a narrower compass, what branch of the building trade is most suitable and most useful for amateurs generally, and householders especially, it must be answered that a knowledge of carpentry and joinery will be found by far the most desirable. Next to this, it is necessary to know something about painting and glazing, which comes fairly within the province of the amateur. Collaterally with these useful arts, paperhanging may be mentioned. It is unlikely that a man will do much smith's work, but even in this it is possible for an amateur to do something, and a slight acquaintance with the arts of brazing, soldering, and working in metals will enable a man to make propagating cases that shall do him good service, and apparatus for heating a small greenhouse, if he have one, at little expense, even if he still leaves it to the peripatetic knife-grinder and tinman to stop up holes in leaking coffee-pots and saucepans, and to renew the damaged bottoms of colanders and milk-strainers.

Bricklaying and Masonry.

Bricklaying and masonry are trades which possibly an amateur will not meddle much with; but some slight acquaintance with the principles of each, and the materials employed, is desirable, even if it be for no other or better purpose than that of giving an eye to any workman who may be employed in this way on the premises, in order to see that he is doing his work in a workmanlike manner, that he is using proper materials, and that he is not wasting his time—a thing which no workman who has any self-respect will do. It is, however, quite as well to be able to know oneself how to set a stone or step that has become loose by one cause or another, in cement, and how to prepare the cement for the work; and know in what proportions sand and cement should be mingled for the purpose of making a suitable composition for fixing the step once again, so that it may remain immovable in its proper position.

Excavating.

Lastly, a knowledge of excavating in all its branches is attended with advantage. In the term "excavating" a far greater variety of work is comprised than appears upon the face of it at first sight. It means far more than digging or hollowing out a pit, as for a well or a trench, or for the foundation of a wall. It embraces these, it is true, but it also implies a knowledge of the manufacture—if we may use the word—

of concrete, and the purposes to which it is put, of making garden walks and paths, and of leveling, so far as it may be applied to the construction of drains for carrying off the surplus water from the soil of the garden, or even from a stable or pigsty, and the laying of drain-pipes for this purpose. It also gathers within its wide embrace a knowledge of the method of making tar paving and burning clay into ballast—processes which will often be found extremely useful in the garden.

Kinds and Prices of Materials.

It is important for every one who attempts to work in wood that he should be familiar with the various kinds of wood that are used, and the purposes for which each is specially adapted. Experience will show that wood which is admirably fitted for one kind of work is by no means suitable for another. The prices, too, of different sorts of wood differ as much as their qualities, and it is desirable that the amateur artisan should become acquainted with these to some extent, that he may know what he is about when he is making purchases of his timber merchant. A knowledge of the prices of the different kinds of wood used in building and furniture making will also be useful to him in other ways. For example, if he intends to put up even so unambitious a structure as a weather-boarded shed, he can, after making his plans and working drawings, calculate to a nicety the quantity of wood that will be wanted, and its cost at the timber yard; and if he finds that the job will run into more money than he expected, he can modify his plans and the mode of structure to suit his pocket.

Working Drawings.

We would urge strongly on the amateur artisan the necessity of preparing careful plans and working drawings to scale of any piece of work that he is about to take in hand, whether large or small, before he attempts to put it in hand. It is an old but true saying, that "Well begun is half done," and the worker in wood or stone or any other building material will be led to appreciate its truth and wisdom when he finds how helpful the making of correct and careful plans and drawings will be to him in the actual performance of the work in question. The whole mode of procedure—what he has to do and how he must do it—will be clearly fixed in his mind before he even touches the material which he is about to work up into the desired form or object, and he will always find the execution of the work to be quicker or slower, according to the extent to which he has previously worked out his plans in his mind, and committed them to paper.

Kinds of Woods Generally Used in Ordinary Carpentry.

Of all the different kinds of wood, deal, or pine, is that with which the amateur will be most frequently employed, and of which it is most necessary that he should know the prices and sizes at and in which it can be procured at the timber yard. We shall now endeavor to convey some idea of the nature of a few common kinds of wood, and the purposes for which they are or may be used.

THE ASH is a hardy deciduous tree, found generally in northern latitudes. In color the wood is greenish white when young, but the grain of timber cut from old trees is often dark and beautifully marked. When in this condition it is frequently used by the cabinet-maker. Its toughness, elasticity, and closeness of grain render the wood useful for making the frames of carriages, agricultural implements, felloes of wheels, etc. Hammer-handles and billiard-cues are frequently made of Ash, as well as the handles of croquet-mallets, and it is much used by coopers. It admits of being bent almost double without snapping, and on that account it is well adapted to be used for curved work.

THE BEECH, a hardy deciduous tree, is found in the northern States and Canada. The color varies; it is mostly light or whitish brown in tint, but is found in all shades of brown, deepening at times to black. The wood is fine and straight-grained, and is, in consequence, easily worked. The grain resembles that of mahogany, and it is often stained to represent it. It is used in the manufacture of furniture-tables, beds, and chairs being made of it. It may be stained to imitate ebony and rosewood.

The BIRCH is a forest tree of graceful appearance, found in cold and temperate regions, and on elevated situations, such as the sides of mountains in warmer countries. The wood is white, firm, and tough, and is used especially in northern countries for making wheels, casks and tubs, and in turnery.

The wood known as CHESTNUT is derived from two widely different kinds of trees—the Horse Chestnut and the Spanish or Sweet Chestnut. The white brittle wood of the Horse Chestnut is used by turners in making fancy goods. The wood of the Sweet, or Edible, Chestnut, is hard and durable, and beautifully grained and variegated. Furniture is sometimes made of it, and it is used with effect for decorative purposes in building.

The name of PINE is given to the timber of a great variety of cone-bearing trees, although the deal or pine cut from different trees varies considerably in quality and general utility. It may be broadly distinguished as Red or Yellow Pine—for the names are indifferently used—and White Pine. In the one kind, the ground color of the wood is yellow, diversified with markings of pale red; in the other kind, the wood is of a whitish color, whence its name. The American White Pine is highly esteemed in carpentry work from its softness and the ease with which it can be worked. While not strong, it is durable. The difference in the two kinds of wood is this: the grain of the Yellow Pine is generally very straight and free from knots, and it is very durable, though it is soft and easily worked. This renders it peculiarly appropriate for all building purposes, whether in the construction of houses or ships. The great height and straightness of the pine renders it well suited for the masts of ships; and when stained and varnished the timber presents a handsome appearance for joiners' work in houses. White Pine is harder and not so straight-grained as Yellow Pine, and it is generally full of knots. The variety known as Silver Fir is used for flooring, and also in the manufacture of household furniture.

The OAK. The best Oak timber in the world is grown in America and Great Britain, from whose forests, until iron came so much into use for ship building, all the Oak was derived for the splendid fleets which have commanded the sovereignty of the seas. Although the grain is somewhat open—too open, indeed, for the purposes of the turner—the wood is extremely hard and durable, but difficult to work, and apt to take the edge pretty quickly off the workman's tools. The wood is dark in color and susceptible of a high polish. It is much used in house building, for houses of the better class, for floors, staircases, doors, the paneling of rooms, etc., and for tables, chairs, sideboards, and other pieces of household furniture.

The POPLAR. This wood is white, soft, and brittle, and is chiefly used in the manufacture of boxes, cases, and children's toys. The softness of the wood causes glass grinders and lapidaries to use horizontal sections as polishing wheels. The wood of the poplar is not liable to shrink, warp, or swell. The fret-sawyer will find it useful for backgrounds, linings, and veneered work.

The wood of the WALNUT is extremely useful and valuable, and is used in the arts for many purposes, of which not the least important is that of the manufacture of ornamental furniture. Its only drawback is its want of density, which renders it liable to injury from blows and rough usage. It is as useful to the turner as to the cabinet-maker, and works well in the lathe. It is desirable to get walnut wood from old, well-grown trees, for the older the tree the more beautiful and diversified are the markings of the wood.

For fret-sawing and all kinds of cabinet work, the wood known as BLACK WALNUT is the most suitable. Unless well seasoned by kiln-drying, or some similar process, it is apt to warp and split. It will take a beautiful polish, and still look well. Plain oiling seems to harden the fibre, and a dead polish will often show better in the work than though it shone like a mirror. This wood ought never to be varnished, since this gives a common look to the article, as it always brings out the grain.

The WHITE WALNUT, known in the United States as the *butternut*, is a pretty wood, but soft. It cuts clean, and is adapted for many kinds of work, which, however, must not be delicate in design.

It has the same grain as Black Walnut, stains well, and shows oiling to advantage.

Strength and Breaking Strain.

The most important qualities of building material necessary to consider are its strength and breaking strain or breaking weight, and the amount of pressure which can be safely laid upon it in accordance with its form, thickness, position, etc. It has been ascertained by actual experiments that the strength of a beam or girder of timber, and hence of any piece of timber, whether large or small, increases directly as the width, and as the square of the depth. Thus, if a piece of wood measuring three inches in breadth and three inches in depth—that is to say, nine inches square in section—will bear a certain weight, a beam six inches broad and three inches deep will bear *twice* the weight; but a beam three inches broad and six inches deep will bear *four* times the weight. The strength is also inversely as the length. If two beams of equal breadth and depth be taken, but one of them be twice as long as the other, the longer beam will only bear half the breaking weight that the shorter one will sustain, or, in other words, will be only half as strong.

It will now be clear why, in laying joists to sustain a floor, the timbers are so placed as to have considerable depth from top to bottom, while the breadth is comparatively narrow.

A continued strain tends to weaken the power of resistance in a beam, and the power will be lessened still more when the weight is variable, or is a rolling instead of a dead weight. The nature of the wood must also be taken into account: thus, some in which the fibre is long and the grain straight will bend to a very great degree, while others in which the grain is short and close will scarcely bend at all, but break suddenly. In framing timber, as the carpenter is called upon to do, all these points must be taken into consideration.

The instantaneous breaking weight of any kind of wood is the weight under which it will give way and break when loaded with the weight in the centre. It has been said that the load with which a beam may be weighted without risk should never exceed more than *one-third* of the breaking weight; but it is better and safer never to let the load exceed *one-fourth* of the breaking weight. Indeed, it is argued that timber is permanently injured if more than this is applied to it. The best authorities on carpentry say that a load cannot be looked on as safe if it exceeds *one-fifth* part of the breaking weight.

It is by no means a difficult thing to find the breaking weight of every piece of timber, and, this being known, the load that it will sustain without injury; this as it has just been shown, estimated by different authorities at from one-fifth to one-third of the breaking weight. The following is a general rule for finding the breaking weight in the middle for girders of wood supported at both ends:

RULE.—*Multiply the breadth in inches by the square of the depth in inches, and divide by the length of bearing in feet. The result obtained, when multiplied by a certain constant or invariable quantity, for the kind of timber under consideration, gives the breaking weight in the centre in hundredweights.*

This constant or invariable quantity, which has been determined by a series of experiments, is stated by Barlow to be: For Ash, 6; for Oak, 5; for Pitch Pine, 5; for Red Pine, 4; for White Pine, 3.

TOOLS USED IN CARPENTRY

An able author and artisan, describes the tools used in carpentry in groups as follows, namely, "Striking tools, saws, cutting tools, planes, boring tools, pincers, guides, and auxiliary appliances." It seems possible, however, to render the classification more complete by the following arrangement:

I. STRIKING TOOLS.
   1. *Tools that are used for striking only, as Hammers and Mallets.*
   2. *Tools that are used for striking and cutting, as Hatchets, Axes, Adzes, etc.*

II. RASPING TOOLS, OR TOOLS THAT ACT BY ABRASION.
   1. *Saws of all kinds, for cutting wood.*

2. *Rasps and Files, for smoothing, shaping, cutting, etc.*

III. Paring Tools of all Kinds.
1. *Planes of various kinds, for smoothing, moulding, etc.*
2. *Spokeshaves and Drawing-knives.*
3. *Chisels and Gouges.*

IV. Boring Tools.
1. *Bradawls, Gimlets, and Augers.*
2. *Brace and Bit, sometimes called Stock and Bit.*

V. Holding or Grasping Tools.
1. *Pincers and Pliers, Nippers, Spanners, and Wrenches.*
2. *The Vice, including Hand-vice, Bench-Vice, etc.*

VI. Tools of Guidance and Direction.
1. *The Carpenter's Rule and Chalk Line.*
2. *The Square, Bevel, Gauge, Mortising-Gauge, Mitre-Box.*
3. *Spirit Level, Straight Edge, Plumb and Level.*
4. *Compasses and Callipers.*

VII. Miscellaneous Tools not subject to Classification.
1. *Screwdriver, Nail-punch, Scriber, Rymer or Reamer, etc.*

Striking Tools.

Of hammers, the amateur should possess three—namely, an ordinary joiner's hammer for heavy work, a lighter one of the same form for medium work, and a light hammer with a small face, usually known as a "ladies' hammer," for driving brads and small fine nails into small light work. If he determines to do any veneering, there is a special kind of hammer used for this purpose which must be obtained.

Many other kinds of hammers are used for various kinds of work, but those named will be sufficient for the amateur's purpose.

In striking a tool with a wooden handle, as a chisel, the wooden mallet, not the hammer, should be used, a convenient size having a head 6 inches long and 2½ by 3½ inches wide in face. The amateur must remember that tools of a medium size are always likely to be most useful to him.

The tools that are used for cutting as well as striking, whose blow severs or splits as well as drives forward, are the adze and axe, or hatchet. The adze is not likely to be required by the amateur; it is used chiefly by shipwrights in ship building, and sometimes by the carpenter. It is with the Axe or Hatchet that the amateur artisan is more immediately concerned, and this is a tool that he cannot do without, for it may be made useful in a variety of ways. In framing timber together it can be used as a hammer, instead of the heavy carpenter's hammer, which the amateur need not place among his tools; and for sharpening stakes or cutting down timber to the size required in the rough, or for splitting pieces of wood, it is invaluable. It should be kept well sharpened, for a blunt axe is useless for any purpose, so far as cutting is concerned, except splitting firewood.

Rasping Tools.

Rasping Tools are those which act by abrasion or rubbing away the material to which they are applied.

There are many kinds of saws in use, but those which the amateur artisan will most require are the Hand Saw, Tenon Saw, Dovetail Saw, Keyhole Saw, and Frame Saw. These are sufficient for all ordinary work. To these, in order to save wear and tear of the hand saw, a saw called a rip, or ripping, saw may be added. This saw has large, triangular teeth, and is used for sawing along the grain. It is therefore useful for sawing planks, battens, and boards the way of the grain; the work being done more expeditiously with a rip saw than a hand saw.

The Hand Saw is generally useful, and will serve the purpose of a rip saw or a panel saw, a finer kind of saw used by joiners.

The Tenon Saw is used more especially for cutting across the grain of the wood, and leaves the surface of the wood that is divided by it as smooth as is possible when the nature of the operation is considered. The blade is of necessity thin and fine, and, in order to keep it straight when in use, it is inserted into a back of iron or brass. It is worked by means of a handle differing in

form from that of the hand saw. A tenon saw to be really useful should be from 14 to 18 inches in length.

The DOVETAIL SAW and the SASH SAW are nothing more than tenon saws of small size, being identical with these in shape and make. They range from 8 to 12 inches in length.

The KEYHOLE SAW consists of a long narrow movable blade. The handle is pierced throughout with a narrow slit sufficiently large to allow of the easy passage of the saw. It is useful for cutting out curved work, while rough coarse fretwork may be done with it, and perforated work for rough carving.

RASPS, generally speaking, are used in carpentry for cutting away or smoothing wood, or for wearing away the sharp edge left in a circular hole that has been cut out with the keyhole saw, so as to impart a bevel to it sloping from above to the under part. A rasp is flat on one side and slightly convex on the other, and is covered with fine projecting points beaten up by a mallet and punch. They are of different degrees of roughness.

The FILE, whose ridges are finer than those of the rasp, is used for cutting metal and sharpening saws.

Paring Tools.

PARING TOOLS, or tools which are used for cleaning away the rough, ragged surface left by the teeth of the saw and rendering wood smooth and even, or otherwise for cutting wood into various forms and shapes, are frequently called *edge tools*, as they present a sharp, keen edge. Indeed, if they are blunt in the least degree they are not fit for use. Watch an artisan at his work, and you will see him frequently rub his plane-iron or chisel on the oil-stone in order to sharpen it. An amateur, especially a beginner, in nine cases out of ten either does not think of doing so, or altogether forgets that there is any necessity for it, and this is one of the chief reasons why amateur's work is often so badly done.

It is important for the amateur to buy none but good tools, and to keep them under lock and key. He must supplement this by keeping them clean and free from rust, and learning to whet the edges of all cutting tools when they show signs of dullness.

The tools that are comprised in the first group of paring tools are Planes. Of these there is a great variety, as formerly, before molding was made by machinery, every different pattern required a different plane or plane-iron. The planes that are most necessary to an amateur are a jack-plane and a smoothing-plane.

The JACK-PLANE is from 15 to 18 inches long and 2½ inches broad, and about the same in depth. Near one end is a handle projecting upwards, and near the other a hole for the reception of the plane-iron, which is held in its place by a wedge. Planes of this description, and smoothing-planes also, are usually made with double irons; that is to say, with two irons held together by a short screw.

The SMOOTHING-PLANE is different from the jack-plane in shape, being about 8 inches long and 2½ inches to 3 inches broad, in the widest part where the iron issues from the wood, tapering to a width of about 2 inches in front and 1¾ inches behind, so that it may be more easily held in the hand. The jack-plane is used for taking the rough surface from the sawn timber, and when this has been removed the smoothing-plane is used to make the surface of the wood perfectly smooth and even.

The SPOKESHAVE and the DRAWING-KNIFE are the tools that are comprised in the second division of paring tools. The drawing-knife is useful for reducing the size of any piece of wood that it may be inconvenient to cut down in any other way. The spokeshave, as its name implies, may be used for imparting a smooth surface to the spokes of wheels, but it is also useful for smoothing down any surface that is not required to be perfectly flat. Thus, a beveled edge may be given to a round hole of any large size cut in a piece of wood. The drawing-knife is always worked towards the operator, but the spokeshave may be used in a direction either towards or from the person who is using it.

The third and last division of paring tools comprises CHISELS and GOUGES. In reality the plane in its simplest form, as

seen in the jack-plane and smoothing-plane, is nothing more than a chisel of considerable width set in a block of wood, which serves as a guide, and by means of which the operator is enabled to work the tool with greater ease and accuracy. A chisel is a flat and thick piece of steel, of which the cutting end is ground to a bevel, in order to obtain a keen edge, while the other is fashioned into a tang, with a projecting shoulder, which fits close against the wooden handle into which the tang is inserted. The gouge differs from the chisel in being hollow instead of flat. Chisels are distinguished as firmer chisels, paring chisels, mortising chisels, and turning chisels. It must be said, however, that the last-named variety differs from the other kinds of chisels in being ground to a bevel on both sides instead of one side only.

It may be mentioned that the tool called a *cold chisel* is a long piece of steel, beveled on both sides at one end to a blunt edge, used by carpenters and others to knock out a hole in a wall of stone or brick for the insertion of a wedge, the end of a piece of timber, etc.

About half-a-dozen chisels and the same number of gouges will be the utmost number that the amateur will require; and, for both chisels and gouges, the widths to be selected may be placed at ⅜ in., ½ in., ¾ in., 1 in., 1¼ in., and 1½ in. The ordinary carpenter's chisels should be purchased first of all. A few paring chisels can be added to the stock at any time if required.

Boring Tools.

The tools comprised in the first division of *boring tools* are bradawls, gimlets, and augers. These tools are, for the most part, extremely simple in construction, the bradawl being a piece of steel sharpened at the end and fixed for convenience of use in a wooden handle; and the gimlet a piece of steel so fashioned at one end that it may take hold of, and cut its way into, timber, and having a small piece of wood or iron attached crosswise at the other end, which serves as a lever to turn the steel shank of the tool, and press it into the wood. The auger is only a gimlet on a large scale, the cross handle being turned by the operator with both hands, which are transferred from end to end of the handle at every half-turn of the tool.

The BIT-BRACE or STOCK-AND-BIT, is the principal boring tool, and, indeed, the only tool of this kind with which the amateur artisan need concern himself. There are breast-drills, fitted with a plate to hold against the breast, steadied with a handle held in the left hand, and having a chuck at the further extremity, in which the drill is placed and caused to revolve at a rapid rate by a large toothed-wheel working in a smaller wheel, the former being turned by a handle held in the right hand.

Other Tools.

In good carpentry everything depends on accuracy of measurement of parts, and fitting the parts together at right angles, or at the required angle or bevel. For the attainment of these most necessary requisites, *tools of guidance and direction* of various kinds are used, without which it would be impossible even for a skilled carpenter or joiner to do his work, and fit the various pieces together with the nicety that is essential in all operations of this nature. Thus, for setting out a long, straight line in ripping a slip of wood from a board, a *line and reel* is required; and for the measurement of any length into parts, or to measure any required length, breadth, and thickness, the *carpenter's rule* is needful. For cutting off the end of a board at right angles to the edge, or for mortising, etc., the *square* must be used, and for cutting wood at any given angle to the edge, the proper line of direction for the saw must be marked by aid of the *bevel*. For cutting notches in wood, or for cutting or planing down pieces of wood to the same thickness, the necessary guide lines must be marked by a *marking gauge*, while in mortising the *mortise gauge* is used.

For joining pieces of wood at right angles, as in making a picture-frame, recourse must be had to the *mitre box;* and for subdividing any given space into smaller spaces, or marking out circles and sweeps of various diameters, the *compasses* must be used. In turning, to make sure of having

the diameter of various parts of the work in harmony with the pattern, these diameters must one and all be tried and regulated by the *callipers* as the work goes on. In bringing horizontal bars, shelves, etc., to a true level, the *spirit level* must be used; and in fixing a post in the ground, or a piece of quartering to the wall, the *upright level* with cord and plumb-bob. A *straight-edge* is useful for testing the nicety and accuracy with which wood has been planed up, and for other purposes. We name these, though the amateur is not likely to need them all. There are many miscellaneous tools and appliances used in carpentry and joinery which are not subject to classification. Among these we may include the screw-driver, the nail-punch, the reamer or rymer, the scribe, the cramp, the glue-pot, and the oil-can. Sand-paper and emery-paper must also be noticed. There is another appliance called the bench holdfast, which is used to hold wood firmly down on the carpenter's bench when necessary.

These tools are so simple and easily obtained that a description of each is not necessary. In there selection *cheapness* is not to be considered, but accuracy and convenience.

The Glue-Pot.

The GLUE-POT should be in every house, whether the tenant turns his attention to household carpentry or not. So many little odd jobs can be done by its aid, that, if nothing more than a hammer and screw-driver be kept, a glue-pot should be purchased. For example, a piece of veneer may come off a looking-glass frame, or any piece of furniture, and may be mislaid or lost before a carpenter happens to be at work in the house, putting these and similar little matters in order. Now, if the piece of veneer is lost it will be a costly business—that is to say, costly in proportion to the actual damage—to replace it, and if the missing piece is not replaced the appearance of the piece of furniture is spoiled, and its value considerably deteriorated. But, if a glue-pot is at hand, the damage may be instantly repaired, and if the mending is carefully done, as it ought to be, the piece of furniture is little the worse for the mishap.

The glue-pot is a pot within a pot, the outer and larger one being of iron, and the smaller one of copper or iron, as the case may be. The glue is broken up small, and placed in the smaller pot, which fits into the larger pot, the rim of the former resting on the rim of the latter. Water is placed in the larger pot, sufficient to nearly fill it when the smaller pot is put in. The pot is placed on or close to the fire, and as soon as the water boils the glue begins to melt, until it is reduced to a semi-fluid condition.

Recipe for Making Glue.

The following is a good recipe for making, or, rather melting, glue. It is given by an authority in "Workshop Receipts:" "Break the glue into small pieces, and soak from twelve to twenty-four hours in cold water; put the glue in the glue-pot, fill the outer vessel with water, and apply heat. For ordinary purposes it should run freely, and be of the consistency of thin treacle. The hotter glue is, the more force it will exert in keeping the two parts glued together; in all large and long joints the glue should be applied immediately after boiling. Glue loses much of its strength by being often melted; that glue, therefore, which is newly made is preferable to that which has been used. When done with, add some of the boiling water from the outer vessel to the glue, so as to make it too thin for immediate use. Put it away till wanted again, and by the time the water in the outer vessel is boiled the glue in the inner is ready melted and of the proper thickness for use. Powdered chalk, brickdust, or sawdust, added to glue, will make it hold with more than ordinary firmness."

To do any kind of work in carpentry and joinery, with blunted tools, in a creditable and workman-like manner is simply impossible. The professional carpenter and joiner will frequently stop in his work to put his plane-iron and chisel on the oil-stone—for he is well aware of the importance of having a keen edge to all cutting tools of this description—and he will take care to keep his saws sharpened and fit for use. It is necessary that the amateur artisan should imitate the regular mechanic

in this essential duty of keeping his tools in a fit condition to do the work that is required of them.

Directions for Sharpening Tools.

Of course all *cutting tools* must be provided with a keen edge, and this is obtained by grinding them to a proper bevel on the grindstone and afterwards rubbing them on the oil-stone. Among *striking tools* the adze and hatchet will require sharpening on the grindstone.

For sharpening or rather for grinding edge tools such as plane irons and chisels, the grindstone is also necessary, finishing off on an oil-stone. It is necessary that the cutting edge should be made as straight and true as possible.

The following directions are for grinding edge tools, which the amateur will do well to follow implicitly, as it is given by a practical workman of great experience. "In grinding plane irons, chisels, and similar tools, *the stone should turn towards the operator*, and the tool should be held very firmly and quite squarely upon the stone, at a point sufficiently near its upper part to allow the tool to be in a nearly horizontal position, while its bevel lies flat upon it. If it is held too low, so that its handle points downwards, the water from the stone will run down the hands and arms, which is decidedly disagreeable, especially in winter." In addition the tool cannot be so firmly held nor the work so readily seen. Keep the edges of the stone in use by constantly traversing the tool across its face, and never try to hurry the work by grinding to a more obtuse bevel than that made by the manufacturer. This is, indeed, generally rather more obtuse than it ought to be, and carpenters reduce this angle, and then the second bevel, formed by the oil-stone, restores it correctly. In grinding planes and chisels, especially the first, it is as well for the amateur to make use of a square to test the correctness of the edge, otherwise the latter may not be truly at right angles to the side of the tool.

The Carpenter's Bench.

One of the most indispensable essentials to the performance of operations in carpentry and joinery is the carpenter's bench. Nothing can be fairly done without it—except sawing, for which the stool is wanted; or mortising, which may also be done on a couple of stools or trestles, although small mortises may be cut on the bench. Planing must be done entirely on the bench, the surface of a board being laid flat on the top of the bench and butted against the bench-stop. In planing the edges, the board must be laid along the side of the bench, being supported on pegs (for the reception of which holes are made along the side itself) in the middle, and at one end nearest the operator, while it is gripped and held tightly against the side by the bench-jaw or vice at the other end.

How to Hold and Handle Tools.

Having provided oneself with the necessary tools and work bench, or such a selection from the whole as may best meet his requirements, the next thing to be done is to learn how to use them. It is next to impossible to do this from printed instructions; and on the principle that a little showing is better than a great deal of telling, the best advice that can be given to the amateur on this head is that he should arrange with some skilled artisan to give him a few practical lessons in the method of holding, using, managing, and sharpening his tools, and the everyday operations in carpentry and joinery, such as sawing, planing, scarfing timbers, cutting rebates, mortises and tenons, dove-tailing, mitring, etc., etc.

THE DIVISIONS OF THE BUILDING TRADE

When any art or manufacture begins to assume importance, and there is a continually increasing demand for the articles, be they what they may, that are made by those who are engaged in it, it has been invariably found that in due proportion to its growth the art or manufacture, as the case may be, becomes divided and even subdivided into

many and various branches, until it is well-nigh impossible to carry the subdivision of the trade to a greater extent.

The building trade is an aggregation of various trades and their separate departments, which have become affiliated, as it were, and grouped together for the better attainment of the end desired.

Taking each a prominent and active part in the building trade we find the excavator, bricklayer, mason, pavior, slater, plasterer, carpenter and joiner, sawyer, ironmonger, smith and founder, zinc-worker, wire-worker, bell-hanger, gas-fitter, plumber, painter, decorator, gilder, paper-hanger and glazier—a goodly array of tradesmen and artisans whose aid and co-operation is absolutely necessary in building and finishing a house.

Practical Knowledge of all the Trades.

It is in doing repairs of an ordinary nature that the amateur will find practical knowledge of the arts connected with the building trades of use to him, in the first place. Secondly, he will find it of equal value in constructing any small building for use or ornament, or for both, out of doors, or for making any appliance within doors; and thirdly, as it has been already urged, he will find it of even more value in enabling him to look after men who may be at work on his premises, and in seeing that the work is done in a proper manner.

Excavations of all kinds can easily be compassed by the amateur, and he will find no difficulty whatever in making and using concrete. In connection with this kind of work lies the making of walls and paths of all kinds, and no one will deny that it is of advantage to the amateur to know how to do these things. In building walls with brick and stone he will probably fail, and more particularly because it is by no means as easily done as other kinds of work that fall more naturally within his compass; but, at the same time, it is desirable to know how to repair and "point" a piece of garden wall, as it is technically called; to fix a step that has become loose with cement; to put a piece of paving to rights and relay a loose paving-stone; and to repair a piece of plastering that has been displaced by damp or other causes.

Work in Metals.

Similarly he may not be able to accomplish much in smiths' work, but it is certainly of advantage to be able to work in iron so far as to be able, by aid of fire, hammer, and anvil, to beat a piece of iron into any shape that may be required, to drill a hole, and to turn a screw, which operations come under the category of forging. Casting, which necessitates the melting of metal in a furnace and running it into a mold, is an operation which may well be left to the iron-founder; but it is useful to possess an iron ladle, and run in lead round an iron bar or rail that has been loosened in the socket cut for it in a stone coping or step.

Zinc-working, as far as making a simple shoot and covering a small flat roof are concerned, and wire-working in the construction of a wire trellis, hanging basket, sieve for sifting earth or cinders, or repairing such articles, are far more practicable; and soldering and simple working in sheet metal are matters with which the amateur may readily make himself acquainted. Plumbing and gas-fitting, which if badly and inefficiently done may involve serious consequences, are best left to professional artisans; but it is as well to know how to stop a leak in a pipe on an emergency, how to take down a gasalier, clean it, and put it in its place again, and how to substitute new gas-burners for old ones with safety.

Decorative Work.

In the decorative portions of the building trade he will find no very great difficulty. House-painting—that is to say, covering wood or metal with a uniform surface of oil paint—may be easily managed, and to a person possessed of taste and manual skill the work done by the decorator will present no very great difficulty. Paper-hanging requires nothing more than care and a certain amount of manual dexterity. Glazing is more easily done than most of the work that has been mentioned, but as it involves handling putty it is not, perhaps, very desirable work. Still, it is work that should be taken up and carried out by the amateur,

as he can put in a pane of glass for about half the price at which a professional glazier will do it if the work be such as can be done at the shop, as the glazing of a light for a pit-frame, etc., and for from one-sixth to one-fourth the price charged if it be a window.

Practical Points in Excavating.

The following facts with regard to excavator's work, may be of use: "In loose ground a man can throw up about 10 cubic yards per day, but in hard or gravelly soils 5 yards will be a fair day's work. Three men will remove 30 yards of earth a distance of 20 yards in a day. A yard (cubic) of concrete requires about 3 hours' labor to mix and throw in, or if in heavy masses, and the materials handy, about 2 hours. With regard to the weight of materials, 19 cubic feet of sand, 18 ditto clay, 24 ditto earth, 15½ ditto lime, 20 ditto gravel, will each weigh one ton. A cubic yard of earth before digging will occupy about 1½ cubic yards when dug. Sand and gravel does not increase more than one-third as much as earth in bulk when dug, but will decrease in height one-fourth more than earth. A wheelbarrow (that is to say the broad, shallow barrow used by navvies) holds $\frac{4}{10}$ yard cube. A cubic yard, or 27 cubic feet of earth, is a single load, and contains 20 bushels; 1 cubic yard of gravel contains 18 bushels in the pit; when dug it will increase nearly one-third in bulk, but will subside nearly one-fourth in height, and decrease one-fifth in bulk when formed into embankments. When earth is well drained it will stand in embankment about 1½ to 1."

This will prove a useful rule for the amateur in throwing up embankments, mounds, etc., in his grounds or garden. If revetted, to use an engineer's term, or covered with turf, the inclination may be greater, because the roots of the grass bind the surface earth together and keep it from being washed down by heavy rains. This will be evident from an inspection of the side of a hedge or bank covered with turf which may be inclined to the horizontal base line at angles ranging from 10° to 20°.

Making Good Concrete.

Concrete, now so much used in forming the foundations of buildings of every description, and even the walls themselves, is a mixture of cement and sand, gravel, broken stones, brick rubbish, or similiar materials in the proportion of one part of cement to five or six parts of any of the other ingredients that are used in its manufacture. Good lime is often used instead of cement, but the amateur, if he uses lime at all, is advised to use cement with it in equal parts. The cement, being the substance that binds the gravel ballast, etc., together into a solid mass impervious to water, is technically called the *matrix*, and the substance that is added to the lime is called the *aggregate*.

It may be said that any waste material of a hard nature may be used as aggregate in making concrete, sand and gravel of all kinds, including pea or fine gravel, pit gravel, river gravel, ashes, cinders, and coke, lime chippings, flints, old stones and bricks, especially when broken, broken earthenware and stoneware, and rubbish from the brickyard may all be used. Slag, too, the refuse of the iron furnaces, can be made available whenever it can be obtained. It should not be used in too large sizes. Pieces about the size of stones ordinarily used for mending roads, or such as will pass through a ring of 2½ inches in diameter, are best suited for the purpose when the material is broken up on purpose for making concrete.

Any of the various cements in general use may be used in the manufacture of concrete, but the amateur is recommended in all cases to use Portland cement.

Quantities of Cement Used.

When made into stucco for covering a wall, the following table will show the extent of surface that a bushel of cement may be made to cover when used pure or with various proportions of sand, and at certain thicknesses:

1 bushel of cement will cover 1⅛ yards 1 inch thick, 1½ yards ¾ inch thick, 2¼ yards ½ inch thick; 1 bushel of cement and 1 of sand, 2¼ yards 1 inch thick, 3

yards ¾ inch thick, 4½ yards ½ inch thick; 1 bushel of cement and 3 of sand, 3½ yards 1 inch thick, 4½ yards ¾ inch thick, 6¾ yards ½ inch thick.

As cement will not keep, especially in a moist atmosphere, the amateur, when he requires a small quantity for repairs, is recommended to buy just so much as he wants and no more.

In making concrete, it is important, in the first place, that the aggregate, be it what it may, should be deposited on a clean place—if on old boards, as scaffold boards, so much the better—so that no dirt may get mixed up with it. The concrete itself should be made on boards, nailed together on ledges or on three putlogs placed on the ground parallel to one another, forming a rough platform. The aggregate and the cement or lime used as the matrix must then be placed on the boards, the aggregate being measured out first, and the proper proportion of concrete to the aggregate being also measured out and thrown upon it. The heap is then wetted with water poured over it from a large water-pot fitted with a fine rose, and the whole is then mixed until the materials are thoroughly amalgamated.

Bricklaying.

BRICKLAYING is in itself an apparently simple process, inasmuch as it consists merely in laying or disposing regular and similar rectangular pieces of baked clay one upon another, layer upon layer, until a certain height is reached, spreading a composition of lime and sand called mortar between each layer, which hardens and connects the bricks together in a tolerably solid mass. There is, however, much more skill in bricklaying than is apparent at first sight, and really good bricklaying cannot be done without practice any more than other building processes.

The tools requisite in bricklaying are a large, strong steel trowel, with which mortar may be spread and bricks chopped asunder or reduced to any extent that may be required in order to produce a perfect bond. Mortar is carried up the ladder, and on to the part of the scaffolding where the bricklayer is at work, by his attendant laborer, in a vessel called a hod, which is shaped like a box, open at one end and cut across diagonally, and fitted at the bottom angle into a short pole. Then a small trowel for pointing, and a mortar-board to hold in the hand, on which the mortar or cement is carried.

A brick is accounted to be 9 inches long, 4½ inches broad, and 2½ inches thick, the breadth being half the length, and the thickness rather more than half the breadth, or one-fourth the length; an arrangement which renders bricks more convenient to use, owing to the correspondence and harmony of proportions in length, breadth, and thickness. The equivalents of the thicknesses of walls enumerated in terms of bricks will, therefore, be, when expressed in inches, ½ brick = 4½ in.; 1 brick = 9 in.; 1½ bricks = 13½ in.; 2 bricks = 18 in.; 2½ bricks = 22½ in., etc. There are many different kinds of bricks, embracing the three classes of building bricks, fire-bricks, and clinkers, or paving bricks.

Mortar for Brickwork.

Bricks are cemented together with mortar, which is a mixture of lime and sand brought to a pasty consistence by the addition of water. When it is desired to make brickwork as strong and durable as possible, the mortar should be made of cement, or a little cement should be added to the lime. The following are the proportions:

Lime and sand, and cement and sand, lose about one-third their bulk when made into mortar, and lime and Portland cement both require one-third their bulk of water to mix. For a rod of brickwork (containing 306 cubic feet and needing 4,352 bricks), 71 cubic feet of mortar will be required, and to make this quantity are required 1½ cubic yards of unslaked lime and 3 of sand; or 1 cubic yard of stone lime and 3½ of sand; or 36 bushels of cement, and the same quantity of sharp sand. Lime or cement and sand, to make mortar, require as much water as is equal to one-third of their bulk, or about 5½ barrels for a rod of brickwork built with mortar.

The mortar used by the old builders was far more durable than the mortar used in

the present day. It hardened into a mass which offered greater resistance to the weather than even the stone itself that it was used to cement together.

The cost of brickwork may be easily calculated from the above memoranda.

Soldering and Brazing.

For zinc-working, plumbing, gasfitting, and all kinds of work in sheet metal, a knowledge of the processes termed soldering and brazing is necessary. By these processes the edges of pieces of sheet metal are joined together, and although it is better for the amateur, for safety's sake, to have all zinc-working that he may require in the way of covering roofs, making zinc pipes, lining wooden cisterns, and similar operations, done by the professional zinc-worker, and to call in the plumber and gasfitter to rectify any leakage in lead pipes or gasfittings, it is as well that he should know how to make a joint in metal, whether sheet or pipe, and possess the few appliances necessary for doing so. If he can do no more than repair tin pots, kettles, etc., it will be of advantage to him, for the itinerant tinman seldom does his work effectually, and seems never to be at hand when his services are most required.

First, then, with regard to soldering and brazing. They may both be described as methods of uniting pieces of either the same or different kinds of metal with a strong and, if necessary, water-tight joint.

To effect this by the first-named operation, namely *soldering*, a compound metal called solder is used. This composition is melted, but the metals to be united do not require to be heated otherwise than through contact with the melted solder.

In the operation of *brazing* the metals to be joined must be raised to the melting point of the brazing composition, which is soft brass. Although this makes the strongest joint, the necessity for exposing the articles to such a great heat renders this operation inapplicable to many purposes.

Soldering is very useful for joining copper and copper, copper and brass, copper and iron, brass and brass, brass and iron, tin and tin, and tin and any other metal. If the joint has to stand a rather high degree of heat—such, for instance, as the seams of a small copper steam boiler—a *hard* solder must be used. By hard solder is meant one that only fuses at a high temperature; a *soft* solder, on the contrary, fuses at a low degree of heat.

The following are the compositions of some of the most useful of solders and alloys, with the degree of heat required to melt each:

Tin.	Lead.	Bismuth.	Mercury.	Melts at
1 part	25 parts	. . .	. . .	558° Fahr.
2 "	1 "	. . .	. . .	340° "
2 "	2 "	1 part	. . .	292° "
5 "	3 "	3 "	. . .	202° "
5 "	3 "	3 "	3 parts	122° "

How Soldering is Done.

The surfaces to be united must be thoroughly cleaned and brightened. Without this the metal will not adhere. The soldering iron must be warmed sufficiently to melt the solder; it must not be made red-hot, because the solder will not "hold to it."

Whilst the iron is warming, *tin* the surfaces by brushing them over with muriatic acid, dipping them into melted solder, and quickly rubbing off the adherent metal. This, if done well, will leave a thin coat of solder. When it cannot be done thus, the surfaces must be tinned by means of the soldering iron. In this case they must be coated or washed with the acid as before, but the solder must be melted on the places required with the hot iron.

When tinned, the surfaces should be brought close together, a little acid rubbed along the joints, and the iron dipped in the acid and put against some solder, so that the melted solder will stick to the iron. The iron must now be applied to the joints, and drawn slowly along in such a manner that the metal between the joints is melted, and the joints filled up. A little practice will soon make the amateur tolerably skilful in doing this. The muriatic acid, or spirit of salt, as it is sometimes called, must be *killed*, or rendered neutral, before it is used, and this is done by putting one or two small pieces of zinc into it and allowing it to expend all its energy on this. Killed acid is much more effective than the raw or pure acid. Sometimes resin is used instead of the acid; but the neutralized acid is

preferable, because it does not leave the work in such a mess as resin.

Should it be desirable for the solder not to adhere to any portion of the article, a paste must be made with whiting and water, and put about those places; this paste will harden with the heat, but can be removed after the soldering operation is effected.

Indoor and Outdoor Painting.

Nearly all that has been said with regard to operations in the building trades is connected with construction, but here we shall speak chiefly of decoration. It has long been found necessary to protect wood and iron from the ill effects of moisture by a hard exterior coating impervious to wet; and hitherto the best preservatives have been found to be paint and varnish, through which no wet can penetrate as long as they remain in a sound state.

In doing work of this kind, it is much better and cheaper to buy paints and varnishes ready mixed. One very good reason why the amateur painter should do this is that the paint which he makes himself is apt to take a long time to get thoroughly dry and hard; and sometimes, even after the lapse of several weeks, it is still sticky.

Before beginning to paint, all dirt and projections, such as lumps of glue, etc., must be cleared away with the putty-knife and duster. Then, if the work be new, all the knots in the wood must be killed with *knotting*, to prevent the turpentine in the knots from oozing out and spoiling the appearance of the painting when finished. Knotting is a preparation of red lead, litharge, boiled oil, and a little turpentine; the amateur is advised to buy the "patent knotting," which may be obtained ready for use. After the knotting, which dries and hardens very quickly, is applied, the *priming*, or first coat, is put on. This is made of white lead, with some drying material, and a little red lead to harden it. It is made very thin with oil, as unpainted wood or plaster absorbs the paint very quickly.

The Several Coats of Paint.

As soon as the priming is dry, all holes made by punching in the heads of nails, cracks, etc., must be stopped with putty. It is useless to attempt to do this before the priming has been applied, because putty will not stick to wood unless painted. After this has been done the *second coat* may be applied; and for new work the second coat of color should be made up chiefly of oil, because oil is the most efficient in stopping the suction of the wood; then a *third*, and even a *fourth coat*, may be applied. In laying on the color, the brush should be passed backwards and forwards and in every direction, to spread the color evenly and work it well into the wood, in the earlier coats.

Finally, the brush should be drawn up and down, or backwards and forwards, as the case may be, in the direction of the grain of the wood, taking care to leave no marks of the hairs of the brush. In painting a door, or any piece of work in which part is sunk and part raised, the mouldings or any bead-work should be painted first with a sash tool, and then the panels, styles, and rails with a brush. No coat should be laid on a previous coat until that coat shall be perfectly dry and hard; and before beginning to paint any piece of work, whatever may be the number of the coat, every particle of dust that may have settled on it should be carefully removed with the dusting brush.

The composition of the paint that is applied to old work, and indeed to wood generally, must depend upon the style or manner in which the work is to be finished. The first coat after the priming in new work should be paint in which the oil predominates over the turpentine: but for the first coat for old work the turpentine should be in excess of the oil. Paint mixed with oil in excess will present a shining surface when dry, but paint mixed with turpentine in excess will present a flat, dead, dull appearance. Therefore, when a shining surface is required, it is necessary that the under coat should be paint mixed with turpentine, the final coat being mixed with oil; but when the finishing coat is to be "flatting," as it is technically called, it must be laid over an under coat or ground color mixed with oil.

Removing Old Paint.

When the surface of a coat of paint, that is to say, of any under coat, appears rough,

especially in the case of patches in old work that have been retouched, the paint, when dry, should be rubbed down with fine glass paper until the roughness has disappeared. All loose paint, or paint that appears loose round the blister-marks, should be scraped away with a knife before the putty is put on. For cleaning old greasy smoke-stained paint limewash or limewater may be used. This kills the smoke or grease, on which no oil paint will ever dry and harden. Some will put a coating of weak size over the smoke and grease; the paint will dry on this, but it is very likely that it will soon crack and peel off.

It is not desirable to keep loading on coat after coat of paint on old work. It is better, when the incrustation caused by successive coats of paint has become very thick, to remove the paint entirely and begin *de novo*. There are various modes of removing paint. The professional painter will do it by the agency of heat, applying a flame to the surface of the paint; the heat soon softens the color, and it may then be scraped away with a knife.

Other Modes of Removing Old Paints.

RECIPE.—*To Remove Old Paint from Woodwork.* (1) Make a very strong solution of common washing soda, and apply it to the paint with a brush until the paint can be scraped away. (2) Apply naphtha to the paint in the same manner, giving it a second and even third damping with this substance until the paint yields. When soft enough scrape it away with a knife. (3) Slake 3 lbs. of stone lime in water, and then add to this 1 lb. of pearlash, and sufficient water to bring the whole to the consistency of thick cream. Apply the preparation with a brush, and leave it on the paint for from eighteen to twenty-four hours, when it will be found that the paint is softened and may be easily scraped off.

The amateur will find it necessary, perhaps, to do his painting work at intervals, often few and far between. If he leaves paint in the paint pot for some length of time, he will discover, much to his annoyance, on resuming work, that the paint is too hard and thick to be used. The addition of some oil and turpentine may save a little of it, but it will neither work pleasantly, nor, indeed, be worth using. Whenever paint must be put aside, a little cold water must be poured on the top of the paint. This prevents the evaporation of the oil, and keeps the paint all right for future use by excluding the air and preventing its action in drying and hardening the paint.

The Care of Brushes.

Similarly, brushes not in use should have the bristles or hair kept under water, that they may remain soft and flexible. It is better, however, when the amateur painter does not know how long it may be before he uses his brush again, to wash the color well out of it by means of a little turpentine, and then allow the brush to dry. When kept in water for some time, the constant soaking will rot the string and the bottom of the wooden handle to which the bristles are attached, and the amateur, on commencing painting, will experience the annoyance of his brush snapping off short like the end of a carrot.

Various Coloring Substances Used in Painting.

It will be useful to the amateur painter to mention the various pigments or coloring substances used in painting to produce different simple colors, and to follow these with a list of colors that are produced by combinations of two or more of these colors. White lead, a substance highly prejudicial to the health, both of those who manufacture it and those who use it, is mixed with all colors to tone them down and produce different shades, hues, and tints. There are, however, other mineral whites capable of supplying the place of white lead, which have the advantage of being non-poisonous pigments.

It will be convenient to classify each set of coloring substances, whether mineral or otherwise, under the color which it yields when properly mixed.

Table of Simple Coloring Substances.

(1) *Whites.*—White lead, including Ceruse and Flake White, Zinc White (oxide of zinc), Griffith's Zinc White (oxy-sulphide of zinc—non-poisonous), Spanish White.

(2) *Blacks.*—Lamp Black, Ivory Black, Blue Black, Vegetable Black, Patent Black.

(3) *Yellows.*—Chrome Yellow, Turner's or Patent Yellow, Naples Yellow, Orpiment, Massicot, Yellow Ochre, Raw Sienna, Yellow Lake.

(4) *Reds.*—Vermilion (crimson and scarlet), Carmine, Cochineal Lake, Madder Lake, Red Lead or Minium, Indian Red, Venetian Red, Spanish Brown, Purple Brown, Orange Lead, Burnt Sienna.

(5.) *Browns.*—Umber (burnt and raw), burned Prussian Blue, Manganese Brown.

(6) *Blues.*—Prussian Blue, Cobalt, Ultramarine, French Ultramarine, Blue Verditer.

(7) *Greens.*—Verdigris, Scheele's Green, Emerald Green, Green Verditer, Italian Green, Saxon Green, Brunswick Green.

Recipes for Tints Produced by Mixing Simple Colors.

Straw Color.—Chrome yellow and white lead.

Lemon Color.—Chrome yellow and white lead; more of the first than in straw color.

Orange.—Chrome yellow and vermilion (bright), yellow ochre and red lead (duller).

Buff.—White lead and yellow ochre.

Cream Color.—Same as for buff, but with more white.

Gold Color.—Chrome yellow with a little vermilion and white lead; or Naples yellow and realgar.

Stone Color.—White lead and yellow ochre, with a little burnt or raw umber.

Stone Color (grey).—White lead, and a small quantity of black.

Drab.—White lead, burnt umber, and a little yellow ochre (warm); white lead, raw umber, and a little black (cool).

Flesh Color.—Lake, white lead, and a little vermilion.

Fawn Color.—Same as for flesh color, with stone ochre instead of lake.

Peach Color.—White lead, with vermilion, Indian red, or purple brown.

Sky Blue.—White lead, Prussian blue, and a little lake.

Olive.—Black, yellow, and a little blue; or yellow, pink, lamp black, and a little verdigris.

Chestnut.—Light red and black.

Salmon Color.—Venetian red and white lead.

Chocolate.—Black, with Spanish brown, or Venetian red.

Sage Green.—Prussian blue, raw umber, and a little ochre, with a little white.

Olive Green.—Raw umber and Prussian blue.

Pea Green.—White lead and Brunswick green; or white lead, Prussian blue, and some chrome yellow.

Pearl Gray.—White lead, with a little black, and a little Prussian blue or indigo.

Silver Gray.—Same as for pearl gray.

Gray (common).—White lead and a little black.

Lead Color.—White lead with black or indigo.

Violet.—Vermilion, white lead, and indigo or black.

Purple.—Violet as above, with the addition of a rich, dark red, or colors for French gray.

French Gray.—White lead with Prussian blue and a little lake.

Lilac.—Same as for French gray, but with less white.

Oak Color.—White lead with yellow ochre and burnt umber.

Mahogany Color.—A little black with purple brown or Venetian red.

In all operations of painting, varnishing, etc., it is of the greatest importance that everything used, whether slab, muller, knife, or brushes, should be kept thoroughly clean.

Varnishes, and Recipes for Making Varnishes.

Varnishes may be bought at the oil and color store at reasonable rates.

A few coats of varnish much improve painted or stained work by imparting to it a smooth and glossy surface. For some work, such as staining, one or two coats will be sufficient, but where it is desirable that the appearance of the article should be as good as it can possibly be made, eight or ten coats will have to be laid on. After the first three or four coats are given and thoroughly dry, take some fine glass-paper and smooth off the brush marks or any gritty particles that may have stuck to the varnish. Then give the work another coat of varnish, which serve in the same manner, and so on for every coat until the last, which should be polished with a flannel rubber dipped in Tripoli powder and water, and finished off with a powder made of suet and flour.

The same precautions must be observed with regard to the brushes used in varnishing as for painting. If put away wet with varnish, they will, after remaining unused for a day or two, be hard and utterly useless. They must, therefore, be well washed immediately after use, and will then be in proper order when again wanted.

Gold Varnish.—Thoroughly wash and cleanse from color one part of gum shellac; when dry pulverize it well, reducing it in a mortar to an impalpable powder; mix with it four times its weight of spirits of wine; put the mixture on the fire, and let it remain until the gum is entirely dissolved. Strain the liquor, and keep for use in a well-corked bottle.

BLACK VARNISH FOR METAL, ETC.—Fuse and thoroughly incorporate asphaltum, ¾ lb.; shellac, 2 oz.; turpentine, 1 quart. Lay on with a brush.

Polishing, and Recipes for Polish.

Polishing very greatly improves the appearance of articles made of any fancy wood or stained work. There are many different sorts of polish; but those for which recipes are given below will be found to answer the amateur's purpose in every way:

FRENCH POLISH.—Spirits of wine, 1 pint; gum sandarac, ¼ oz.; gum lac, ½ oz.; gum shellac, ½ oz. Expose the whole to a gentle heat, frequently shaking the mixture until the gums are dissolved.

NAPHTHA POLISH.—Wood naphtha, ½ pint; orange shellac, 1 oz.; dragons' blood, ¼ oz.; benzoin, ¼ oz. Prepare in the same way as French polish.

SHELLAC POLISH.—Orange shellac, 1½ oz.; spirits of wine, 1 pint.

The method of applying these polishes is the same for all. A flannel rubber is made and dipped in the polish, and a piece of fine and old linen is then put over the rubber. When the polish oozes through the covering, dip the pad into or slightly moisten it with linseed oil. Another way is to strain the linen over the flannel pad, and then to moisten the linen with a drop or two of the polish and a drop or two of oil. The pad should be held in the right hand, and the linen strained tightly, so that the pad may present a rounded surface. Apply the pad to the surface of the wood in a series of light strokes made by a circular sweep of the hand until the surface is nearly dry, when the pad should be passed up and down in the direction of the grain of the wood. When the rubber is dry some more polish and oil must be put upon it in the same manner as before, and the rubbing continued.

Plenty of what is generally called "elbow-grease" should be given to the work, and not too much polish. Beginners generally lay on a large quantity of polish in clots or thick coats, but when this is done the polish does not look well, neither has it a permanent effect.

No more polish should be laid on than is absolutely necessary. The polish should be well rubbed in and finished off with a little pure naphtha or spirits of wine, whichever happens to be the spirit that is used in the polish. The naphtha or spirits of wine, as the case may be, should *at first* be laid on very gently and with great care, otherwise it will dissolve and remove the polish already laid on; but if proper care is taken its effect will be not only to give the polish a better gloss, but to render it more lasting. Some woods absorb a great deal of polish. In order to prevent this absorption, a coat of gold size, or something of a like nature, is given before the application of the polish. When polishing mahogany or other ornamental or colored wood, should there be any inequalities or faults in any conspicuous part of the object, fill them up with stopping, consisting of plaster of Paris mixed to the consistency of cream with water, tinted with staining or coloring matter corresponding with the color of the article that is to be polished. A mixture of putty, consisting of finely-pounded whiting and painters' drying oil and some coloring matter, will do quite as well. For large holes a composition of beeswax, resin, and shellac is found very useful.

Paper Hanging.

Next to painting, the most important decorative work that can be done within the house is paper-hanging, and a knowledge of the mode of doing this will often prove of great advantage to the amateur artisan, especially if he be a man of slender means.

Besides the American there are two other wallpapers used in paper-hanging, one being of English and the other of French manufacture. The French paper-hangings are perhaps prettier, more artistic, and produce a better effect than American or English-made papers, but they are much more expensive. They may be distinguished from English papers by their narrow width, the English papers being 22 inches wide and the French and American papers only 20 inches. Again, a *piece* of English paper is 12 yards long, and a *piece* of French paper about 9½ yards, the former covering 7 square yards, or 63 feet superficial, and the latter 4¾ square yards, or 41 square feet. Speaking approximately, therefore,

where two pieces of English paper are required, three of French will be wanted at the very least, and in practice this will not be found to be enough.

The American paper is in more common use now, and for quality and artistic effect equals that of foreign make. It comes in *rolls* of *two pieces* each, or 16 yards, a piece being considered 8 yards long. The width is 20 inches over all or 18 inches net A *piece* then will cover 36 square feet of surface.

On looking at a piece of wall-paper it will be found that the pattern does not come quite out to the edges, so that it must be remembered, in measuring a room for paper, that 18 inches is the absolute net width of the pattern (American); the actual roll of paper itself is wider than this. To measure a room, one method is to measure the circumference, making allowance for doors and windows, and, having ascertained the number of feet, multiply this by the height of the room and divide by the number of square feet in a piece of paper. For the ceiling multiply the length of the room by breadth, which will give area, and divide as before. If a room has offsets these may be measured separately. Thus, taking the room to be 18 ft. by 15 ft., and allowing 11 ft. for doors and windows, and taking the height of the room to be 9 ft., between skirting-board and cornice we have:

18ft. + 18ft. + 15ft. + 15ft. (length of 4 sides of room) — 11ft. (allowance for door and windows) × 9ft. (height between ceiling and skirting) ÷ 36 (No. of square feet in piece of paper).

Or 66 — 11 × 9 ÷ 36, or 55 × 9 ÷ 36 = 14 pieces, or 13 and a fraction, which requires of course 14 full pieces, or 7 rolls, for the sides. The ceiling would be 18 × 15 ÷ 36 = 7½, or 8 pieces.

Small Patterns Most Satisfactory.

The most satisfactory kind of pattern is a small geometrical one, consisting of some simple form, a leaf or flower, conventionally treated. For staircases, passages, etc., papers in imitation of wood or marble are most commonly used, and these can be preserved from much casual injury by varnishing. Marble papers are usually hung in large blocks, the lines of demarcation, horizontal and vertical, being traced, with the aid of a straight edge, in black or brown. For sitting-rooms satin papers, or papers with a glossy surface, are generally used. Papers in which gold is introduced are expensive if they are worth anything at all. In cheap gilt papers, the gold, which is most likely Dutch metal, soon tarnishes and changes as time goes on from a dull copper-red to black. It is good taste to have the ceiling paper light in color and with a subdued figure to harmonize with the sides.

Preliminary Work for Paper Hanging.

If the wall be new it will require sizing before the paper is put on, though this is by no means done as a rule. If the wall has to be re-papered, it must be stripped of the old paper, or *should be* stripped, as new papers are too frequently hung upon old papers; a procedure which is certainly not cleanly, and is in many cases prejudicial to health, because the dampness caused by putting up the new paper often detaches the old paper from the surface of the wall, and oftentimes, if the paste used in hanging the old paper has been bad, a fungus is generated, which spreads over the wall in dark patches of a brown or greenish color.

In re-papering a room after any one stricken down with some infectious disorder, such as scarlet or typhus fever, on no account should the old paper be left on the walls, but it should be carefully stripped and the walls washed, and the ceiling coated with limewash, after the old coating has been taken off with clean water. As soon as this is done, the walls may be sized and the process of re-papering may be proceeded with.

Size is a kind of weak glue, made from the clippings of parchment, glove-leather, fish-skin, and similar substances, by boiling them down in water. When cold it resembles jelly. It is sold by all oil and color dealers.

The wall being sized, it is necessary to determine what tools are absolutely necessary for the paper-hanger's work. These may be summed up as a pair of boards connected by hinges, or, if preferred, simply grooved and tongued together, or even joined by dowels or pins. The amateur

need not provide himself with a pair of boards and trestles merely for the sake of papering a single room; a kitchen table, if long enough, or even a dining table suitably protected, will answer every purpose. The boards are portable, and, therefore, useful to the regular paper-hanger, who may not find any suitable table at the house to which he is going. They are also of greater length than most tables, which is obviously an advantage. Whether the amateur is provided with boards or not, he must of necessity have a pair of good-sized scissors; a pail to hold his paste, whether of wood or iron it matters not, so long as it is clean; and a paste brush, something similar to that used for whitewashing, but smaller.

Paste for Paper Hanging.

Good paste for paper-hanging is made of old flour, mixed to a milk-like consistency with water. When put in the saucepan to boil, a little size or glue may be added, which will increase its tenacity. A little alum may also be added to paste, in order to cause it to spread more freely; this ingredient has the property of keeping paste sweet and wholesome, and it is generally used in the thicker kinds of paste, such as shoemakers' paste, partly for this purpose. The paste when boiled should be of the thickness of ordinary gruel, and must be laid on the paper smoothly and equally with backward and forward strokes of the brush. Care should be taken not to load the brush with too much paste at one time, lest the paper should be rendered too damp. It will sometimes happen that through an over-abundance of paste a little is pressed out at the edges when the cloth is used to dab the paper against the wall. Any paste that makes its appearance should be removed by means of a sponge dipped in clean water, but the amateur must be careful to avoid smearing the colors of the paper. The colors will often be started in a slight degree by the influence of the damp paste, and if the surface be smeared the only thing that can be done is to paste a piece of fresh paper over the smear, which, if left as it is, will prove a continual eyesore.

Where to Begin to Hang Paper.

Where to make a commencement in hanging a room with paper will be a bit of a puzzle to the amateur paper-hanger. The rule is that the edges of the paper when hung shall be towards the window; that is to say, that if there be a window in the room the paper must be hung from either side of the window round the room, the junction being finally effected in some corner of the room or some recess, where the mismatching of the pattern would not be so apparent.

When it has been ascertained by actual measurement how much paper is required for hanging on each side of the commencement, wherever it may be, whether on each side of the window or from the middle line over a mantel-shelf, proceed to cut the paper. The usual way is to unroll the paper for a yard or two, cut the edge on one side, roll up the paper just cut, lightly and loosely, and continue unrolling, cutting, and rolling up by a yard or two at a time till the other end of the roll is reached. Some will then cut the other edge, proceeding in the same way until the paper is rolled as it was before the cutting commenced, having the topmost piece at the outer end. It is important to remember that whichever side is cut close to the pattern, the opposite side must not be cut closer than from ¼ in. to ½ in. of the pattern. The edge that is not cut close need not, in point of fact, be cut at all; the chief object in cutting it is to leave as small an extent of overlapping as possible where the strips are joined together. The best paper-hangers, who can set the paper to a line, trim close on both sides and do not overlap, but set to the edge.

Cutting Paper into Lengths.

When the edges are cut the next step is to cut the paper into lengths suitable to the height of the room, and this, whether the overplus at top and bottom be much or little, must be done in such a manner that when the second strip is pasted up by the side of the first the pattern will join neatly and exactly, leaving as few traces as possible, if it leave any, of the line of junction. The "match" is shown by certain marks

on the edge of the paper, and if it be found that a considerable length of paper be left either at top or bottom, or at both, it will be better and more convenient for the amateur in carrying out the operation of hanging each slip to cut off the surplus paper, leaving no more than an inch or two at top and bottom beyond the length between skirting and cornice. Cut the paper straight across, which can be easily done by aid of the pattern, and cut as many lengths as will suffice for one or two sides of the room to begin with. Lay the lengths thus cut face downwards on the pasting-board, letting the edge of each strip as it is laid down project a little beyond the edge of that which is immediately below it, in which the uppermost strip is the last strip laid down. This prevents the paste from getting under the edges of the piece below when the piece above is being pasted.

Attaching to the Wall.

As many strips as may be required having been laid one on top of another on the board, the first strip may be pasted, but a little judgment must be used as to the time that may be allowed to elapse before the paper is attached to the wall. If the paper be cheap, and therefore thin and unsubstantial, it must be hung up as quickly as possible after the paste is put on; but if it be a stout, good paper, some two or three minutes may elapse between pasting and hanging; and a thick paper may be left even twice as long, to allow the damp to penetrate the paper and render it more easy of manipulation and less liable to be crushed or broken. For easier manipulation it is better to loop up the lower end of the paper, the paste causing the paper to adhere slightly where one part comes in contact with another. Then fold back the top, and putting the hands, which should be perfectly clean and free from paste, under this fold, attach the paper to the wall, bringing the top upwards with the hands to meet the cornice. Care should be taken beforehand to make a guide line on the wall, or to see that the woodwork round the window is perfectly upright, and this will assist the amateur in fixing the first strip truly perpendicular. After attaching it lightly to the wall, the plumb-line may be applied to see that all is true and vertical, and if all is right release the fold, and, after letting the paper hang straight down, lift it away from the wall, except for about six or eight inches below the cornice, and then let the strip fall, when it will gently float down into its place.

The next step is to press the paper against the surface of the wall in every part, and for this purpose the amateur must be provided with some clean soft cloths. First of all, the paper must be pressed down the middle from top to bottom with firm but gentle pressure, avoiding all rubbing, which may have the effect of starting the color and smearing and spoiling the paper. Then press from the centre outwards on both sides in a downward direction. The paper in some cases will lay smooth and flat against the wall, but if the paper be cheap and thin there will in all probability be many wrinkles all over the surface. Do not attempt to press these flat. The paper has stretched under the influence of the moisture of the paste, and as it dries it will contract again and lay as flat as possible all over the wall to which it is attached. Lastly, draw the scissors over the paper just below the cornice and just above the skirting-board, making a crease. Then pull the paper gently from the wall as far as may be necessary, cutting off the edges along the mark or crease made by the scissors, and restore the ends to their places, dabbing them lightly as before with the cloth, which should be so doubled up as to form a large, loose pad.

The second strip may now be put up in the same way. Here, however, the chief anxiety will be to match the pattern neatly, for if the first strip be put up perpendicularly the other strips will be perpendicular as a matter of course. Nevertheless it will be as well for the amateur to test his work occasionally by the plumb-line, to make sure that it is not getting out of the perpendicular.

It may be that the amateur will not be successful in his first effort, and then all that can be done is to sacrifice the strip of paper, pull it down, and try again. As in everything else, practice is necessary to enable a man to do this work well and quickly.

It will be advisable, then, for any beginner to try his 'prentice hand in an attic or some small room of no great consequence, in order to give him some idea of the way in which paper must be handled and attached to the wall. He will soon gain confidence in himself, and find no great difficulty in papering other rooms where it will be absolutely necessary that the work be neatly and accurately done.

Borders should be neat in design, and match the paper in this respect and in color, or if the colors do not harmonize they should be in agreeable contrast. A cable pattern generally looks well, or the Grecian rectangular pattern, known as the Greek key pattern. The representation of a simple molding is often very effective, and when the paper is plain in character and geometrical in pattern a floral border is admissible. It must be remembered, however, that a border, however good it may be, tends to detract from the apparent height of the room, and therefore is not so well calculated for a low room as for a high room, to which the horizontal lines of the border impart an appearance of breadth and space.

BELLS AND TELEPHONES

The electric bell constitutes one of the most simple pieces of apparatus for signaling by electricity, and although more than half a century has elapsed since it was first introduced, no better method of signaling or giving a *call* has yet been invented for land lines. It is always used for attracting attention in telephonic communication and very often also in telegraphy.

To Wire for and to Connect Electric Bells.

It is easy to understand that an electric bell equipment usually consists of one electric bell, one cell of battery, one push-button, and wire enough to connect the outfit for a reasonable distance.

The push-button is, of course, set at the place from which the signal is to be given, and, when connected, the pressing of the button should ring the bell. The bell should continue ringing as long as the button is pressed. The bell should be placed where the persons who are expected to answer it [when it rings] are likely to be, so it can be heard by them. The battery, the motive power, is placed at some convenient place, the closer the battery is placed to the push-button, the better for some work.

The wire is used to make the connection to the bell, battery, and push-button. The proper way to connect an electric bell outfit is to run one wire from the push-button to the battery, one wire from the push-button to the bell, and one wire from the bell to the battery. This gives two wire ends at each place, namely, bell, battery, and push-button. The bell, battery, and push-button each have two places where the wires are connected. To all places to which wires are connected the insulation covering of the wires must be removed, and the wire made clean and bright. Then connect it with the connecting places of the push-button, bell, and battery. This way of connecting an electric bell outfit is called a metallic circuit.

A Grounded Circuit.

On long distances wire can be saved by using a grounded circuit, which is done as follows: Drive a piece of iron into the earth, from four to five feet down, connect a wire to the iron driven into the ground by wrapping the bare wire tightly around the iron. This ground wire is then run to the battery and connected to the zinc side. A second wire is run from the carbon side of the battery to one side of the push-button; a second wire runs from the push-button to wherever the bell is placed; a wire is run from the bell to a second ground iron, and attached or connected to the ground iron, the same as the first ground connection was made. Where long distances are to be connected, namely, from house to stable, factory or any other building, this way of doing electric bell work is frequently done. All wires that are outside of buildings should be fastened on to porcelain or glass insulators, and never be nailed against brick or stone walls, or any frame buildings; always use insulators, and have wires clear of all places.

It is recommended for electric bell work that no lighter wire than what is known in the trade as No. 16 be used, and that the wire have a good insulation or covering.

Making Connections.

In all ordinary electric bell work, if reasonable care is taken, no connections or splices are necessary in the wire. Should it be necessary to make a connection of two ends of wire, make a good one and solder it; do not neglect doing this (soldering connections) in case you cannot solder the connections, wrap them with tin foil, or some tissue paper, and on top of this use some insulating tape, making a good covering over the wire again. Do not, however, use insulating tape right on a wire connection, as the place gets corroded, and is an injury to good work.

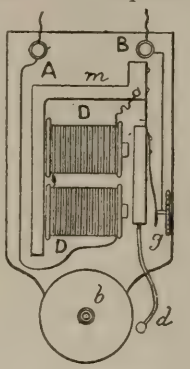
When it is desired electric bell work can be so arranged so one, two or more bells can be rung from one or as many more places as desired. This is all simple work, and can be easily understood by making electric bell circuit diagrams, to show similar points on same line.

The wire for push-buttons must be always connected in multiple, with the wire attached to the first push-button. This is easily done by making half connections. The push-button end of wires must always be so connected in open circuit bell work.

The bells when so connected that two or more ring simultaneously, should be also connected in multiple.

The Working of the Bell.

The electric bell consists essentially of an electro-magnet and a vibrating armature piece which oscillates in front of it. If a current enters the terminal A it is conducted through the coils D D of the electro-magnet, which has iron cores, and passes out through the metal of the armature, the contact screw, *g*, and the terminal B. Such a current will, of course, cause the electro-magnet to draw the armature down on to its terminals, the armature itself being attached by a flexible steel spring to the framework, so as to make this movement possible. In the act, however, of drawing down the armature, the contact of the screw *g*, and a prolongation of the armature spring, is broken, and as this contact forms part of the electric circuit, the current ceases to magnetize the electro-magnet; the armature is, therefore, no longer attracted and springs back by virtue of the steel spring, and contact between it and the screw, *g*, is restored, which causes the same operation to be repeated. This motion takes place very rapidly to and fro, and is communicated to a light hammer, *d*, which strikes the bell, *b*, and produces a continuous and loud ringing sound. The whole apparatus forms a simple method of drawing attention from a distance, and can always be relied upon to work properly.



—Electric Bell.

The only drawback to the bell is that if the screw, *g*, is set so as to make it as sensitive as possible, a vibration of the support to which the whole apparatus is fixed, due to a passing train or vehicle, might be sufficient to cause the hammer to strike the gong. In railway signal-boxes, where electric bells are much used, it is absolutely necessary that this should not happen, as it might lead to a serious catastrophe. The bells in this case are, therefore, so arranged that on closing the electric circuit the bell-hammer only strikes the gong once, and only when the circuit is broken again outside the bell does it spring back so as to be ready for a second signal.

Alternating Currents.

Such vibrating electric bells will work with both direct and alternating currents, but not nearly so well with the latter. As, however, it is very often found desirable to use alternating currents, a special *polarized* bell has been devised for use with them, in which the armature, the amplitude of whose movement is regulated by screws, vibrates in a vertical plane between two poles of an electro-magnet, bent round at right angles.

No make-and-break mechanism is necessary as in ordinary bells, because the alternating current is continuously reversing the sign of the poles of the electro-magnet, causing the armature and bell-hammer to vibrate, by alternate attraction and repulsion. It is usual in these bells to intensify the sound by using two domes, making use of the return stroke of the hammer.

The current is produced by a small magneto dynamo worked by hand. This method of dispensing with primary batteries is due to Siemens, and has the advantage that a high E.M.F. (Electric Motive Force) can be generated at no expense, the power being supplied by the operator himself.

Cautions to be Observed.

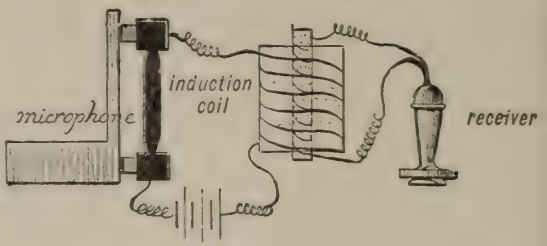
To sum up, then, let us say that in putting up electric bells, telephones, etc., there are several points which must be carefully attended to, if satisfactory working is desired; the conducting wires must be as well insulated as possible. Mere touching contacts should be avoided unless absolutely necessary. If possible contacts or joints should be soldered so as to make a good metallic connection. If any connections are made by terminals or binding screws, they must be carefully cleaned and seen to from time to time: this remark applies especially to the battery terminals, which are more likely to become corroded by the electrolyte. The general arrangement of the wires should be first mapped out on paper, and this plan carefully adhered to in putting them up, otherwise confusion and trouble will arise.

Putting up Telephones.

There are two very distinct methods of *transmitting* the voice possible in telephonic systems: electro-magnetic *transmitters* for use without batteries, and transmitters on the microphone principle requiring some external source of current. The instruments for receiving the voice are called *receivers*, and are always based on the principle of the electro-magnetic transmitter.

The first practical telephone was invented by Graham Bell, and patented by him in 1877; it was also invented independently about the same time by Elisha Gray. The principle of this telephone is based on the laws of electro-magnetic induction.

A complete apparatus for telephonic communication consists: at the transmitting station, of a microphone, battery, and induction coil, and a bell-push which rings



Apparatus for the Transmission of Sound by Electricity.

a bell at the receiving station to draw attention; at the receiving end, of Bell telephone receiver and the call-bell.

Line Wires.

In towns, each person having a telephone is connected to an exchange, and by which he can be connected at will to any other person also connected to the exchange.

The line wires, connecting the transmitting and receiving stations, consist of two copper conductors of high conductivity and great tensile strength. It is found that alloys of copper and silicon, or copper and aluminium, are best for this purpose. The wires have a resistance of about 80 ohms per mile, and their breaking tension is about 150 lbs. With wire weighing about 19 lbs. per mile, spans of 100 to 150 yards are possible. The wires, if overhead, are supported on porcelain insulators, which are attached at a convenient height from the ground to posts or houses; in the country trees often come in handy for the purpose. In cities the best method is to lay them underground, where they are safe from the effects of fire or weather; this, however, is rarely done, as overhead wires are so very much cheaper.

If a telephone line does not run anywhere near any other telephone, telegraph, or electric circuit, the return wire may be replaced with economy by the earth. In this case very careful connection must be made with the earth at each end. A good plan is to solder the connecting wire to a water pipe, but if this is not available, it must be connected to a large metallic plate of copper buried deeply in damp earth, which it is as well to water from time to time. It is best to avoid this earth return for telephones if possible, as it is very seldom satisfactory.

In fixing up the telephone apparatus it should never be attached to thin partitions which are capable of vibration, but should be screwed to a solid wall, and even then it is as well to place a couple of layers of felt between the instrument and the wall.

Number of Bells Required.

A couple of cells of almost any make such as Daniells or Le Clanche are quite enough for working a short telephone line, and for longer distances three or four at the outside are sufficient, for, an excess of electromotor force produces a crackling sound in the receivers, which may be loud enough to seriously inconvenience conversation. For electric bells the number of cells required depends upon the length of the line and the resistance of the bells used, and the right number is usually found by experiment.

If a telephonic line is to be established near a telegraph line, it becomes necessary to use a metallic wire for the return, because the effects of induction, due to the making and breaking of the telegraph current, when an earth return is used by both circuits, becomes sometimes great enough to spoil all telephonic communication.

As a matter of fact it is very seldom that an earth return can be used for telephone lines, for the circuit is then always liable to external disturbances, such as leaks from electric light and power circuits, telegraph currents, earth currents, etc. Even with twin wires the greatest attention must be paid to good insulation of the line, otherwise the above-mentioned disturbances may make their influence felt. When all such stray currents have been eliminated from the system, the length of a telephone line may be greatly increased; conversation has been carried on quite distinctly at distances of 800 and 900 miles.

Operating a Telephone.

The manipulation of a telephone instrument is quite simple. In nearly every type of instrument the receivers are hung on a hook which is pivoted on an axis. This movable hook has a spring attached to it so that, when the receiver is hung on it, the hook falls and distends the spring. If the receiver is unhooked the spring is released and the hook is drawn up. It is really a switch, and the up-and-down movement causes the proper connections of line and bell, and line and telephone to be made. To enter into communication with another person through the exchange, the handle of the magneto-generator is turned, or a button is pressed. The exchange answer the signal by ringing the subscriber's bell. The receiver is then unhooked and placed to the ear, and the mouth is placed opposite the microphone. The attendant at the exchange asks what number is required, which being given the proper connection is made there, and the two persons are now in direct communication. When the conversation is finished, the bell is again rung to signify the fact, and the attendant at the exchange disconnects them.

Batteries.

Batteries are connected by attaching the carbon side of one cell to the zinc side of the next; follow this for any number and there will always remain one carbon pole and one zinc pole to which line wires may be connected. Batteries should be examined occasionally and cleaned. Do not use more salamoniac than will readily dissolve and have a small amount in bottom of cell. Place the batteries so they may not be exposed to draughts or heat. Use soft rainwater in the solution. Six ounces of salamoniac to a jar is enough. When the batteries appear to be doing too much work or become weak, examine all connections; look for leaks where wires cross or touch. Test each battery separately by connecting it with the two poles of a bell used for that purpose.

The practical mechanic—the amateur workman—the busy man of affairs—the housekeeper—the farmer, have occasions for useful information about the common materials used in building and repairing and for the tables and measurements used in the different trades and business pursuits, which are seldom found outside of books treating of special trades. These facts and figures also enable one to deal intelligently with the mechanic and tradesman. They are *time-savers*, and hence are *money-makers*. Such information is only secured after long and diligent search and comparison of authorities. We give many of the important ones.

FACTS AND FIGURES FOR EVERY DAY USE

Shingles.

The best shingles are of white cedar. When of good quality, they will last 40 to 50 years in our Northern States. Cypress and white pine are much used for shingles, but will not last half as long as white cedar.

Shingles are packed 250 to the bundle, or 4 bundles to 1,000.

1 Bundle 16-inch shingles will cover 30 square feet.

1 Bundle 18-inch shingles will cover 33 square feet.

When laid 5½ inches to the weather, 5 lbs. 4° or 3¾ lbs. 3° nails will lay 1,000 shingles.

Clap-Boards.

1 Bundle laid 3½ inches to the weather will cover 26 square feet.

Painting.

For outside wood-work, paint made from white lead ground in linseed oil is most used. If the oil is *raw*, or unboiled, *dryer* is added; if *boiled*, no dryer is necessary. Not less than four coats should be applied—five are better.

Paint, ready mixed, put up in cans or kegs, may be procured from manufacturers or dealers. These paints have to be thinned by adding 1 pint of oil to about 2½ lbs. of paint. When thinned, 1 lb. will cover about 2 square yards of first-coat, 3 yards of second, and 4 yards of each subsequent coat; or 1⅜ lbs. to the square yard will be required for 4 coats, and 1⅝ lbs. for 5 coats.

For inside work, either white lead or oxide of zinc is used, and for good work 4 coats are necessary.

For iron exposed to the weather, metallic paints, such as yellow and red iron ochres or brown hematite ore, finely pulverized and mixed with oil or dryer, are best.

For iron subject to the action of water, red lead is best.

Plastered walls should stand a year before painting.

Painting is measured by the square yard, girding every part of the work that is covered by paint and allowing an addition to the actual surface for the difficulty of covering deep quirk of moldings and for "cutting in" as in sash and shelving, or where there is a change of color, on same work.

Painter's Putty.

Spanish whiting, pulverized,	80.6	Made into a stiff paste.
Boiled oil,	20.4	If not intended for immediate use, raw oil should be used.

One pound of putty for stopping every 20 yards.

Glazier's Putty.

Whiting, 70 lbs.; boiled oil, 30 lbs.; water, 2 galls. Mix. If too thin, add more whiting; if too thick, add more oil.

To Soften Putty.

To remove old putty from broken windows, dip a small brush in nitro-muriatic acid or caustic soda (concentrated lye), and with it anoint or paint over the dry putty that adheres to the broken glass and frames of your windows; after an hour's interval the putty will have become so soft as to be easily removable.

White and Other Washes.

For outside wood-work. In a tight bushel, slake half a bushel of fresh lime by pouring over it boiling water sufficient to cover it 4 or 5 inches deep, stir until slaked: add 2 lbs. of sulphate of zinc dissolved in water, add water enough to bring all to the consistency of thick whitewash.

For inside work. Add 2 quarts of thin size to a pailful of wash just before using. The common practice of mixing salt with whitewash should not be permitted.

For brick or stone-work. Slake ½ bushel of lime, as before, in a barrel; then fill the barrel ⅔ full of water and add a bushel of hydraulic cement; add 3 lbs. sulphate of zinc dissolved in water. These washes may be colored by adding powdered ochre, umber, etc.

Stone-Work.

A perch of stone work is 1 rod long, 1½ feet thick and 1 foot high, and contains 24¾ cubic feet.

A cord of stone, like a cord of wood, contains 128 cubic feet, and will make a 100 cubic feet of wall. Three bushels of lime and a cubic yard of sand are usually estimated for a cord of stone.

Stone walls are measured by the perch (24¾ cubic feet). Openings less than 3 feet wide are counted solid; over 3 feet deducted, but 18 inches are added to the running measure for each jamb built. Arches are counted solid from their spring. Corners of buildings are measured twice. Pillars less than 3 feet are counted on 3 sides as lineal, multiplied by fourth side and depth.

It is customary to measure all foundation and dimension stone by the cubic foot. Water tables and base courses by lineal feet. All sills and lintels or ashlar, by superficial feet, and no wall less than 18 inches thick.

The greatest safe load per super. foot on

Granite Piers	40 tons.
Lime stone Piers	25 "
Sand stone Piers	15 "
Brickwork in Cement	3 "
Rubble Masonry	2 "
Lime Concrete Foundations	2½"

The height of brick or stone piers should not exceed 12 times their least thickness at base.

Concrete Walls.

Concrete walls for houses are built of 1 of cement to 6 or 7 of broken stone, shingle, gravel, or slag. The substance mixed with the cement must be free from loam, fine sand, clay, or dirt of any kind.

To prevent the cement from adhering to the planks of the mould, apply freely to them, with a brush, soap boiled to the constancy of paint.

Plastering.

Estimate of material for 100 square yards.

Materials	Two coats slipped coat finish	Three coats with hard finish
Quicklime	3½ casks	4 casks
" for fine stuff		⅔ "
Plaster of Paris		½ "
Laths	2,000	2,000
Hair	3 bushels	4 bushels
Common Sand	6 loads	7 loads
White Sand		2½ bushels
Nails	13 lbs.	13 lbs.
Mason's labor	3½ days	4 days
Laborer	2 "	3 "

Plastering laths are usually of white or yellow pine, 1½ inches wide, ¼ inch thick, and 3 or 4 feet long. They are nailed up horizontally, about ½ inch apart. The upright stud of partitions are spaced at such distances apart, (usually about 15 inches centre to centre), that the ends of the laths may be nailed to them. Laths are sold in bundles of 1,000 each. A square foot of surface requires 1½ four-feet laths, or 1,000 such laths will cover 666 square feet. A carpenter can nail up the laths for from 40 to 60 square yards of plastering in a day of ten hours, depending on the number of angles in the room, etc.

Plastering is always measured by the square yard for plain work, by the superficial foot for cornices of plain members, and by lineal foot for enriched or carved mouldings in cornices.

Brick-Work.

Brick-work is generally measured by 1,000 bricks laid in the wall. In consequence of variations in size of bricks, no rule for volume of laid brick can be exact. The following scale is given as a fair average for general use.

7	Bricks	to a	super.	foot	4″ Wall	= 40 lbs.
14	"	"	"		9″ "	= 94 "
21	"	"	"		13″ "	=121 "
28	"	"	"		18″ "	=168 "
35	"	"	"		22″ "	=210 "

Corners are not measured twice as in stone-work. Openings over 2 feet square are deducted. Arches are counted from the spring. Fancy work counted 1½ bricks for 1. Pillars are measured on their face only.

A cubic yard of mortar requires 1 cubic yard of sand and 9 bushels of lime, and will fill 30 hods.

One thousand bricks, closely stacked, occupy about 56 cubic feet.

One thousand old bricks, cleaned and loosely stacked, occupy about 72 cubic feet.

One superficial foot of gauged arches requires 10 bricks.

Stock bricks commonly measure 8¾ inches by 4¼ inches by 2¾ inches, and weigh from 5 to 6 lbs. each.

Paving-bricks should measure 9 inches by 4½ inches by 1¾ inches, and weigh about 4½ lbs. each.

One yard of paving requires 36 stock bricks, of above dimensions, laid flat, or 52 on edge; and 35 paving bricks laid flat, or 82 on edge.

Slating.

A square of slate or slating is 100 superficial feet.

In measuring, the width of the eaves is allowed at the widest part. Hips, valleys, and cutting are to be measured lineal, and 6 inches width extra is allowed.

The thickness of slates ranges from 3–16 to 5–16 of a inch, and their weight varies from 2.6 to 4.5 lbs. per square foot.

The *lap* of slates varies from 2 to 4 inches. The standard is assumed to be 3 inches.

To compute the number of slates of a given size required per squares.

Subtract 3 inches from the length of the slate, multiply the remainder by the width and divide by 2. Divide 14.400 by the number so found, and the result will be the number of slates required.

The *pitch* of a slate roof should not be less than 1 in. height to 4 in. length.

Dimensions of slates and numbers required to a square. 12x6 requires 533 to the square; 14x9 requires 291; 18x9 requires 213; 24x13 requires 105.

Rules for Obtaining Approximate Weight of Iron.

For Round Bars.

Rule: Multiply the square of the diameter in inches by the length in feet, and that product by 2.6. The product will be the weight in pounds, nearly.

For Square and Flat Bars.

Rule: Multiply the area of the end of the bar in inches by the length in feet, and that by 3.32. The product will be the weight in pounds, nearly.

Wrought Iron, usually assumed:

A cubic foot	=480 lbs.
A square foot, 1 inch thick	= 40 "
A bar 1 in. square, 1 foot long	= 3½ "
A " " " 1 yard long	= 10 "

To find the weight of Cast-Iron Balls when the diameter is given.

Rule: Multiply the cube of the diameter by .1377.

To find the diameter of Cast-Iron Balls when the weight is given.

Rule: Multiply the cube root of the weight by 1.936.

To find the weight of a Spherical Shell.

From the weight of a ball of the outer diameter subtract the weight of the inner diameters.

To Test Quality of Iron.

If fracture gives long silky fibres of leaden-gray hue, fibres cohering and twisting together before breaking, may be considered *a tough, soft iron*. A medium even grain mixed with fibres, a good sign. A short, blackish fibre indicates badly-refined iron. A very fine grain denotes a *hard, steely iron*, apt to be cold, short, hard to work with the file. Coarse grain with brilliant crystallized fracture, yellow or brown spots, denotes a *brittle iron*, cold, short, working easily when heated; welds easily. Cracks on the edge of bars, sign of hot, short iron. Good iron is readily heated, soft under the hammer, and throws out but few sparks.

All iron contains more or less carbon—the hardest the most.

The breaking strain on various metals is shown in the following table, the size of the rod tested being in each case one inch square, and the number of pounds the actual breaking strain:

	Pounds.
Hard steel,	150,000
Soft steel,	120,000
Best Swedish iron,	84,000
Ordinary bar iron,	70,000
Silver,	41,000
Copper,	35,000
Gold,	22,000
Tin,	5,500
Zinc,	2,600
Lead,	860

Average Weight of Animals.

Cart-horse, 14 cwt.		Riding-horse, 11 cwt.	
Ox,	7 to 8 "	Pig,	1 to 1½ "
Cow, 6½ to 8 "		Sheep,	1 "

Average weight of a man, 140 lbs.

A dense crowd of people, 85 lbs. per square foot.

Average Number of Cubic Feet Per Ton of Various Substances for Estimating Work or Stowage.

Iron	4.7
Lead	3.2
Brick	22
Clay	22
Sand	24
Earth, loose	28
Granite	16
Oak	39.5
Ash	45
Cedar	72
Mahogany, sp.	45
Deal	50
Pine, red	55
" yellow	77
Water, fresh	36
" salt	35
Coke	90
Coal (stowed)	48
Wood (equivalent) requires	288

WORKSHOP RECIPES

A Home-Made Lubricator.—Tallow and plumbago thoroughly mixed make the best lubricator for surfaces when one is wood or when both are wood. Oil is not so good as tallow to mix with plumbago for the lubrication of wooden surfaces, because oil penetrates and saturates the wood to a greater degree than tallow, causing it to swell more.

To Protect Metal Surfaces From Rusting.—Melt 1 oz. of resin in a gill of linseed oil, and while hot mix with it two quarts of kerosene oil. This can be kept ready to apply at any time with a brush or rag to any tools or implements required to lay by for a time, preventing any rust, and saving much vexation when the tool is to be used again.

Glue to Resist Moisture.—1 lb. of glue melted in 2 quarts skim-milk.

Marine Glue.—1 part of India-rubber, 12 parts of mineral naphtha or coal-tar. Heat gently, mix, and add 20 parts of powdered shellac. Pour out on a slab to cool. When used, to be heated to about 250°.

Glue Cement to Resist Moisture.—1 part glue, 1 part black rosin, ¼ part red ochre. Mixed with least possible quantity of water. Or 4 parts of glue, or 1 part oxide of iron, 1 part of boiled oil (by weight).

To Remove Rust From Steel.—Steel which has been rusted can be cleaned by brushing with a paste compound of ½ oz. cyanide potassium, ½ oz. castile soap, 1 oz. whiting, and water sufficient to form a paste. The steel should be washed with a solution of ½ oz. cyanide potassium in 2 oz. water.

To Preserve Steel From Rust.—1 part caoutchouc, 16 parts turpentine. Dissolve with a gentle heat, then add 8 parts boiled oil. Mix by bringing them to the heat of boiling water; apply to the steel with a brush, in the way of varnish. It may be removed with turpentine.

To Clean Brass.—1 part Roche alum and 16 parts water. Mix. The articles to be cleaned must be made warm, then rubbed with the above mixture, and finished with fine tripoli.

Blue Print Solution for Photographer.—1 pint citrate of iron ammonia, 2 pints red prussiate of potash, 1 pint gum arabic, 3 pints water.

Do.—1¼ oz. red prussiate of potash in 11 oz. water, 1⅞ oz. citrate of ammonia in 5 oz. water. Mix together and keep in dark place. Corrections can be made with a pen dipped in a solution of caustic soda. Also by bi-carbonate of soda. Also by a solution of lime.

Tinning Acid for Zinc or Brass.—Zinc, 3 oz.; muriatic acid, 1 pt. Dissolve, and add 1 pt. water and 1 oz. sal-ammoniac.

To Solder Brass Easily.—Cut out a piece of tinfoil the size of the surface to be soldered. Then apply to the surface a solution of sal-ammoniac for a flux. Place the tinfoil between the pieces, and apply a hot soldering-iron until the tinfoil is melted.

To Solder Without Heat.—Steel filings, 2 oz.; brass filings, 2 oz.; fluoric acid, 1¼ oz. Dissolve the fillings in the acid, and apply to the parts to be soldered, having first thoroughly cleaned the parts to be connected. Keep the fluoric acid in earthen or lead vessels only.

To Tin Brass and Copper.—Make a mixture of 3 lbs. cream of tartar, 4 lbs. tin shavings, and 2 gallons water, and boil. After the mixture has boiled sufficiently, put in the articles to be tinned, and continue the boiling. The tin will be precipitated on the articles.

To Use in Case of Burns.—A free application of soft soap to a fresh burn almost instantly removes the fire from the flesh. If the injury is very severe, as soon as the pain ceases apply linseed oil, and then dust over with fine flour. When this covering dries hard, repeat the oil and flour dressing until a good coating is obtained. When the latter dries, allow it to stand until it cracks and falls off, as it will in a day or two, and a new skin will be found to have formed where the skin was burned.

How to Mix Inks or Paints for Tints.—A larger quantity of the first-named color must always be used. Dark green and purple make bottle green. White and medium yellow make buff tint. Red, black, and blue make dark brown. Bronze blue, lemon yellow, and black make dark green. White, medium yellow, and black make drab tint. White, lake, and lemon yellow make flesh tint. Lemon yellow and bronze blue make grass green. White and black make gray tint. White and purple make lavender tint. Red, black, and medium yellow make maroon. Lake and purple make magenta. Medium yellow and purple make olive green. Medium yellow and red make orange. White, ultramarine blue, and black make pearl tint. White and lake make pink. Ultramarine blue and lake make purple. Orange, lake, and purple make russet. Medium yellow, red, and

white make sienna. White and ultramarine blue make sky blue. Ultramarine blue, black, and white make slate. Vermillion and black make Turkey red. White, yellow, red, and black make umber.

Time-Savers.—We give the following figures as worth remembering. They will save calculation and give approximately accurate results with least amount of labor:

Four loads, (cubic yds.) of stone, three bushels of lime and a cubic yard of sand, will lay one hundred cubic feet of wall.

Five courses of brick will lay a foot in height on a chimney.

Nine bricks in a course will make a flue eight inches wide and twenty inches long, and eight bricks in a course will make a flue eight inches wide and sixteen inches long.

Eight bushels of good lime, sixteen bushels of sand and one bushel of hair, will make enough mortar to plaster one hundred square yards.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching of the floor.

One thousand laths will cover seventy yards of surface, and eleven pounds of lath nails will nail them on.

One thousand shingles laid four inches to the weather, will cover one hundred square feet of surface, and five pounds of shingle nails will fasten them on.

A Polish for Wood.—The wooden parts of tools, such as the stocks of planes and handles of chisels, are often made to have a nice appearance by French polishing; but this adds nothing to their durability. A much better plan is to let them soak in linseed oil for a week, and rub with a new cloth for a few minutes every day for a week or two. This produces a beautiful surface, and has a solidifying effect on the wood.

To Calculate the Number of Shingles for a Roof.—To calculate number of shingles for a roof, ascertain number of square feet, and multiply by four, if two inches to weather, 8 for 4½ inches; and 7 1-5 if 5 inches are exposed. The length of a rafter of one-third pitch is equal to three-fifths of width of building adding projection.

A Chimney that Will Draw.—To build a chimney that will draw forever, and not fill up with soot, you must build it large enough, sixteen inches square; use good brick, and clay instead of lime up to the comb; plaster it inside with clay mixed with salt; for chimney tops use the very best of brick, wet them and lay them in cement mortar. The chimney should not be built tight to beams and rafters; there is where the cracks in your chimney comes, and where most of the fires originate, as the chimney sometimes get red hot. A chimney built from the cellar up is better and less dangerous than one hung on the wall.

Keeping Tools.—Keep your tools handy and in good condition. This applies everywhere and in every place, from the smallest shop to the greatest mechanical establishment in the world. Every tool should have its exact place, and should always be kept there when not in use.

Keeping tools in good order, and ready to use is as necessary as keeping them in the proper place. To take up a dull saw, or a dull chisel, and try to do any kind of work with it, is worse than pulling a boat with a broom, and it all comes from just the same source as throwing down tools carelessly—habit, nothing more or less. To say you have no time to sharpen is worse than outright lying, for, if you have time to use a dull tool, you have time to put it in good order.

Three Thermometer Scales.—There are three standard thermometers in use, each a recognized standard in one or another part of the world. The scale of Reaumur (R.) prevails in Germany. As is well known, he divides the space between the freezing and boiling points into 80°. France uses that of Celsius (C.), who graduated his scale on the decimal system. The most peculiar scale of all however, is that of Fahrenheit (F.), a renowned German physicist, who in 1714 or 1715 composed his scale, having ascertained that water can be cooled under the freezing point without congealing. He did not take the congealing point of water which is uncertain, but composed a mixture of equal parts of snow and *Sal Ammoniac*, about—14° R. This scale is preferable to both those of Reaumur and Celsius, or, as it is called, Centigrade, because: 1. The regular temperatures of the moderate zone move within its two zeros, and can therefore be written without — or —. 2. The scale is divided so finely that it is not necessary to use fractions when careful observations are to be made. These advantages, although drawn into question by some, have been considered so weighty, that both Great Britain and America have retained the scales, while the nations of the Continent use the other two. The conversion of any one of these scales into another is very simple. 1. To change a temperature given by Fahrenheit's scale into the same given by the Centigrade scale, subtract 32° from Fahrenheit's degrees and multiply the remainder by 5-9. The product will be the temperature in Centigrade degrees. To change from Fahrenheit's to Reaumur's scale, subtract 32° from Fahrenheit's degrees, and multiply the remainder by 4-9. The product will be the temperature in Reaumur's degrees. 3. To change a temperature given by the Centigrade scale into the same given by Fahrenheit, multiply the Centigrade degrees by 9-5, and add 32° to the product. The sum will be the temperature by Fahrenheit's scale. 4. To change from Reaumur's to Fahrenheit's scale, multiply the degrees on Reaumur's scale by 9-4, and add 32° to the product. The sum will be the temperature by Fahrenheit's scale.

Weighing Liquids.—One gallon of pure water weighs nearly 8½ lbs. avoirdupois. "A pint is a pound" is an old saying, and very nearly true. The gallon containing 231 cubic inches, is the standard unit of wine measure. The British gallon, called the Imperial gallon, contains 277.274 cubic inches.

THE PROJECTORS OF THE ATLANTIC CABLE

The laying of the Atlantic Cable revolutionized the history of the world. Cyrus W. Field succeeded after many years of failure and disappointment. There never was a better illustration of how faith and perseverance bring success

ENGINES AND BOILERS

Steam Boilers.—For all boilers three different parts, viz., fire-surface, water-space and steam-room, must be considered. Each part or division has a distinct and separate duty to perform. The fire-surface includes the furnace and combustion chamber, flues and tubes; the water-space is that part occupied by the water; and the steam-room is the reservoir which holds and supplies the steam necessary to run the engine.

For convenience, we may state that all steam-boilers are either internally or externally fired. When the fuel is burned in an iron furnace surrounded with a water-jacket or water-log, as in the case of the locomotive, marine and portable boilers, they are internally fired. Cylinder-flue, double-deck, tubulous and sectional boilers are said to be externally fired, because the fuel is burned in a brick furnace lined with fire-brick.

A perfect steam-boiler should be made of the best material sanctioned by use, and should be simple in construction. It should have a constant and thorough circulation of water throughout the boiler, so as to maintain all parts at one temperature.

There should be a combustion chamber so arranged that the combustion of the gases commenced in the furnace may be completed before the escape to the chimney.

Have all parts readily accessible for cleaning and repairs.

In every boiler there should be ample water-surface for the disengagement of the steam from the water in order to prevent foaming. There should also be a large excess of strength over any legitimate strain, and proportioned for the work to be done.

Only the very best gauges, safety-valves, fusible plugs, and other fixtures should be used.

In a *water-tube boiler* there should be from 10 to 12 square feet of heating surface for one horse-power; in a *tubular boiler* 14 to 18 square feet of heating surface for one horse-power; in a *flue boiler* 8 to 12 square feet of heating surface for one horse-power; a *plain cylinder boiler* should have from 6 to 10 square feet of heating surface for one horse-power; a *locomotive boiler* should have 12 to 16 square feet of heating surface for one horse-power; a *vertical boiler* should have from 15 to 20 square feet of heating surface for one horse-power.

When considering the heating surface of a boiler, a vertical or upright surface has only one-half the evaporative value of a horizontal surface above the flamet; that is, the sides of a locomotive fire-box are only half as effective per square foot as the flat top of the box. In flues and tubes, the effctive surface, measured on the circumference, is 1¼ times the diameter.

Useful Rules for Calculations.

To find the fire-grate surface of flue boilers.—Square the nominal horse-power, and divide it by the heating surface in *square yards;* the quotient will be the fire-grate surface in square feet—or, one square foot of fire-grate surface per nominal horse-power.

To find the heating surface of a flue boiler.—Square the nominal horse-power as indicated by the manufacturer's receipt or bill of sale, and divide that by the fire-grate surface in *square feet;* the quotient will be the heating surface in *square yards.*

Capacity of boiler flue.—One cubic yard of boiler capacity for each nominal horse-power. *Steam-room* should be about eight times the contents of the cylinder of the engine supplied with steam by the boiler.

Tubular or marine boilers.—Each nominal horse-power requires the evaporation of one cubic foot of water per hour; 12 square feet of heating surface, only three-fourths of the whole tube surface being taken as effective; and 30 square inches of fire-grate per nominal horse-power. The sectional area of the tubes to be about one-sixth of the fire-grate.

General rule for all classes of boilers.—Twelve square feet of heating surface and three-fourths square foot of fire-grate per nominal horse-power, are very good proportions.

TEMPERATURE INDICATED BY THE COLOR OF THE FIRE.

To determine the temperature of a furnace fire from the color of the flame:

Faint red	960° F.
Bright red	1,300° F.
Cherry red	1,600° F.
Dull orange	2,000° F.
Bright orange	2,100° F.
White heat	2,400° F.
Brilliant white heat	2,700° F.

How to Care for Boilers.

Every one who owns a steam-boiler, as well as the engineer who is responsible for the same, should at all times exercise the greatest care. A fifteen-story building may be fire-proof and ever so strong, yet a defective boiler in the basement or carelessness in its management, may cause an explosion which will wreck the whole structure. The following suggestions are important:

1. Great care should be exercised to see that safety-valves are ample in size and in working order. Overloading or neglect frequently leads to the most disastrous results. Safety-valves should be tried at least once a day to see if they will act properly.

2. The first duty of an engineer before starting is to see that the water is at the proper height. Do not rely on glass gauges, floats or water alarms, but try the gauge-cocks.

3. The steam-gauge should stand at zero when the pressure is off, and it should show same pressure as the safety-valve when the latter is blowing off. If not, then one is wrong, and the gauge should be tested by one known to be correct.

4. Both gauge-cocks and water-gauges must be kept clean. Water-gauges should be blown out frequently, and the glasses and passages to gauge kept clean.

5. Feed-pumps or injectors should be kept in perfect order, and of ample size. No make of pump can be expected to be continuously reliable without regular and careful attention. It is always safe to have two means of feeding the boiler. Check-valves and self-acting feed-valves should be frequently examined and cleaned. Satisfy yourself that the valve is acting when the feed-pump is at work.

6. Cold water should never be fed into a boiler if it can be avoided, but, when necessary, it should be caused to mix with the heated water before coming in contact with any portion of the boiler.

7. In case of low water immediately cover the fire with ashes (wet if possible) or any earth that may be at hand. If nothing else is handy use fresh coal. Draw fires as soon as it can be done without increasing the heat. *Neither turn on the feed, start or stop engine, or lift safety-valve until fires are out and the boiler cooled down.*

8. Fusible plugs, when used, must be examined when the boiler is cleaned, and carefully scraped clean on both water and fire sides, or they are liable not to act.

9. Moderately thick fires are most economical, but thin firing must be used when draught is poor. Take care to keep the grates evenly covered, and allow no air-holes in the fire. Be especially careful to lay the coal along the sides and in the corners. All lumps should be broken into the size of a man's fist. With bituminous coal, firing in front, and then shoving the coal back, when it is coked, gives the best result. Do not "clean" fires oftener than necessary. The cleaning of the fire is best done, in ordinary working, by a "rake," or other tool, working on the under side of the grate, and not by a "slice-bar," driven into the mass of fuel *above* the grates.

10. Clean all heating surfaces outside and in, or there will be serious waste of fuel. As a rule, never allow over one-sixteenth scales or soot to collect on surfaces between cleanings. Hand-holes should be frequently removed, and surfaces examined, particularly in case of a new boiler, until proper intervals between cleanings have been established by experience. Examine mud-drums and remove sediment therefrom.

11. When foaming occurs in a boiler, checking the outflow of the steam will usually stop it. If caused by dirty water, blowing down and pumping up will generally cure it. In cases of violent foaming, check the draught and cover the fires.

12. Never empty the boiler while the brickwork is hot.

13. Don't indulge in rapid firing. Steam should be raised slowly from a cold boiler.

14. If a boiler is not required for some time, empty and dry it thoroughly. If this is impractical, fill it quite full of water, and put in a quantity of common washing soda.

15. All things about the boiler-room should be kept clean and in good order. Negligence tends to waste and decay.

For the Engineer and Firemen

Always start your engine slowly, so that the air and water condensation can be expelled from your cold cylinder; then you will gradually bring it to its regular speed.

Keep open the drip cock, both in the front and back ends of the cylinder, when the engine is standing still, and never close them until all the water has dripped out.

Never let in any oil or tallow to your cylinder until it is made hot by the steam.

Be careful not to put in too much oil at any time, knowing, as you do, that it will be sent to the feed-water causing your boiler to prime and foam.

Always *oil up* before starting your engine.

Generally, when you pack the piston packing, both cylinder and packing are cold, and if they are screwed or wedged in very tight while in this condition that the expansion, when exposed to the heat of the steam, will induce great rigidity.

Then the oil or lubricating substance cannot enter between the surfaces in contact, and that great friction, heating and cutting will be the result.

When packing loses its elasticity it is no good, and should be removed.

Piston or valve-rod packing, should never be screwed up more than sufficient to prevent it from leaking, and that the softer the packing the longer it will last and the better your engine will run.

For Steam-Heating of Houses.—To estimate for the steam-heating of dwellings it is safe to allow one square foot of boiler surface for each ten square feet of radiating surface. Small boilers should be larger proportionately than large boilers.

Each horse-power of boiler will supply from 250 to 350 feet of 1-inch conducting pipes, which equals about 80 to 120 square feet of radiating surface.

It is safe to estimate that under ordinary circumstances, one horse-power of boiler capacity will heat about as follows:

15,000 to 20,000 cubic feet in brick buildings in blocks.

10,000 to 15,000 cubic feet in brick stores in blocks.

10,000 to 15,000 cubic feet in brick dwellings, exposed all sides.

7,000 to 10,000 cubic feet in brick mills, shops, etc.

7,000 to 10,000 cubic feet in wooden buildings, exposed.

6,000 to 10,000 cubic feet in foundries and wooden shops.

All the joints should be made steam and water tight, as the slightest leak in a steam-heating system is apt to damage furniture, curtains, carpets, etc., if the steam is intended to heat a dwelling. Red or white lead is all right as material to make up joints, but graphite is much better. For gaskets there is nothing better than asbestos.

How to Thaw Out a Frozen Steam-Pipe.—A good way to thaw out a frozen-up steam-pipe, is to take some old cloth, discarded clothes, waste, old carpet, or anything of that kind, and lay on the pipe to be thawed; then get some boiling hot water and pour it on. The cloth will hold the heat on the pipe, and thaw it out in five minutes. This holds good in any kind of a freeze, water-wheel, or anything else.

Steam as a Cleansing Agent.—For cleaning greasy machinery nothing can be found that is more useful than steam. A steam hose attached to the boiler can be made to do better work in a few minutes than any one is able to do in hours of close application. The principal advantages of steam are, that it will penetrate where an instrument will not enter, and where anything else would be ineffectual to accomplish the desired result. Journal boxes with oil cellars will get filthy in time, and are difficult to clean in the ordinary way; but, if they can be removed, or are in a favorable place, so that steam can be used, it is a veritable play-work to rid them of any adhering substance. What is especially satisfactory in the use of steam, is that it does not add to the filth. Water and oil spread the foul matter, and thus make an additional amount of work.

Suggestion for Hot-Water Heating Systems.—Let your "risers" not be less than 1¼", for smaller pipes soon become coated, if the water used contains lime or other matters in solution or suspension.

Galvanized pipe is best; it does not become rusty and discolor the water.

In ordinary pipe be sure to get "galvanized steam," and not "galvanized gas."

Let your draw-off services be for bath 1", to lavatories 1", for hot water ½". Do not make the "draw-offs" too small; it takes too long to drain a pipe of cold water.

The larger the pipes the freer the circulation, and, if you have hard water, they will remain in good order longer.

Be sure that all joints are secure and free from leaks, and always look through a pipe before fitting it in place, to see that there is no dirt or impediment to the flow of the water through it.

Avoid the use of elbows in circulating pipes, use only bends; if you cannot avoid using an elbow, see that it is a round one.

A Cheap Filter.—A cheap filter which any tinner can make is 12 x 6 inches in size, and 8 inches high. The water flows in near the top, and on the top is a door through which to get into it to clean it. The outlet pipe at the bottom projects 2 inches up on the inside to hold the dirt back. A large sponge is placed inside, which forms the filtering medium, which, of course, can be cleaned as often as desired. The place of the sponge may be taken by powdered charcoal placed in a cotton bag.

TABLES OF MEASURE AND WEIGHT

Linear Measure.

12 inches = 1 foot.
3 feet = 1 yard.
5½ yards, 16½ feet = 1 rod.
320 rods, 5,280 feet = 1 mile.
4 rods, 100 links = 1 chain.

Square Measure.

144 square inches = 1 square foot.
9 square feet = 1 square yard.
30¼ square yards, 272¼ square feet = 1 square rod.
160 square rods, 10 square chains = 1 acre.

Cubic Measure.

1,728 cubic inches = 1 cubic foot.
27 cubic feet = 1 cubic yard.
128 cubic feet = 1 cord.
24¾ cubic feet = 1 perch of stone.

Dry Measure.

2 pints = 1 quart.
8 quarts = 1 peck.
4 pecks, 2150.4 cubic inches = 1 bushel.

Liquid Measure.

4 gills = 1 pint.
2 pints = 1 quart.
4 quarts, 231 cubic inches = 1 gallon.

Avoirdupois Weight.

16 ounces, 7,000 grains = 1 pound.
2,000 pounds = 1 ton.
2,240 pounds = 1 long ton.

Troy Weight.

24 grains = 1 pennyweight.
21 pennyweights = 1 ounce.
12 ounces, 5,760 grains = 1 pound.

Apothecaries' Weight.

20 grains = 1 scruple.
3 scruples = 1 fluid dram.
8 fluid drams = 1 ounce.
12 fluid ounces = 1 pound.

Apothecaries' Measure.

60 minims = 1 fluid dram.
8 fluid drams = 1 ounce.
10 fluid ounces = 1 pint.

Time Measure.

60 seconds = 1 minute.
60 minutes = 1 hour.
24 hours = 1 day.
7 days = 1 week.
365 days = 1 year.
366 days = 1 leap year.

Circular Measure.

60 seconds = 1 minute.
60 minutes = 1 degree.
360 degrees = 1 circle.

English Money.

4 farthings = 1 penny.
12 pennies = 1 shilling.
20 shillings = 1 pound.
21 shillings = 1 guinea.

Surveyors' Linear Measure.

7.92	inches	= 1 link.
25	links	= 1 rod.
100	links or four rods	= 1 chain.
80	chains	= 1 mile.

Paper Measure.

24 sheets = 1 quire.
20 quires = 1 ream.
2 reams = 1 bundle.
5 bundles = 1 bale.

NOTES.—The chain (*ch.*), used by surveyors is called Gunter's chain, and consists of 100 links (*l.*). Its length is 792 inches, equal to 66 feet, or 4 rods. Its divisions are decimal, so that chains and links may be written as one number in the same manner as dollars and cents,

Thus, since 35 links equal .35 of a chain, 35 links is written *25.35 chains*.

Any year the number of which is exactly divisible by 4, but not by 100, is a leap year. When the number is divisible exactly by 400 it is also a leap year.

The solar or tropical year has a length of 365 days, 5 hours, 48 minutes, 49.7 seconds.

The Metric System.

1. The Metric System of weights and measures has been legalized in the United States. Its fundamental unit is the meter, from which all the other units of the system are derived. The meter is equal to 30.37 + inches.

2. The meter is defined as the ten-millionth part of the distance from the Equator to the North Pole, measured on the meridian passing through Paris. Later measurements have shown that the meter does not exactly correspond with the length required by the definition.

3. The principal point of superiority of the metric measures is in their decimal scale. As in the case of United States money, several denominations may be written together as one number. Thus, 9 Mm. 7 Km. 5 Hm. 3 Dm. 8 m. 4 dm. 6 cm. 5 mm. may be written as one denomination: 97538465 mm., or 9753846.5 cm., or 97538.465 m., or 9.7538465 Mm., etc. Reduction ascending and reduction descending thus become a mere matter of moving the decimal point.

Metric Measures.

10 millimeters (*mm.*)	=	1 centimeter, . . . *cm.*
10 centimeters	=	1 decimeter, . . . *dm.*
10 decimeters	=	1 meter, ... *m.*
10 meters	=	1 dekameter, . . . *Dm.*
10 dekameters	=	1 hektometer, . . *Hm*
10 hektometers	=	1 kilometer, . . . *Km.*
10 kilometers	=	1 myriameter, . . *Mm*

Metric Square Measure.

100 sq. millemeters	=	1 sq. centimeter,
100 sq. centimeters	=	1 sq. decimeter,
100 sq. decimeters	=	1 sq. meter,
100 sq. meters	=	1 sq. dekameter,
100 sq. dekameters	=	1 sq. hektometer,
100 sq. hektometers	=	1 sq. kilometer.

NOTE.—The principal unit is the square meter, equal to 1.196 sq. yds.

Metric Land Measure.

100 centares (*ca.*)	=	1 are, ... *a.*
100 ares	=	1 hectare, ... *Ha.*

NOTE.—The *are*, equal to a square dekameter, or 100 square meters, is 119.6 square yards, very nearly. The *hektare* is equal to 2.471 acres.

Metric Cubic Measure.

1000 cubic millimeters = 1 cubic centimeter,
1000 cubic centimeters = 1 cubic decimeter,
1000 cubic decimeters = 1 cubic meter.

NOTE.—The *cubic meter* is equal to 35.3166 cubic feet. When used to measure *wood* or *stone*, it is called a *stere* (pronounced *stair*). Ten *steres*, called a *dekastere*, are equal to 2.759 cords.

Metric Capacity Measure.

10 milliliters (*ml.*)	=	1 centiliter, (*cl.*)
10 centiliters	=	1 deciliter, (*dl.*)
10 deciliters	=	1 liter, (*l.*)
10 liters	=	1 dekaliter, (*Dl.*)
10 dekaliters	=	1 hektoliter, (*Hl.*)
10 hektoliters	=	1 kiloliter, (*Kl.*)

The *liter*, (*l.*), equal to a cubic decimeter, is 61.028 cubic inches, 2.1135 pints, or 33.816 fluid ounces. The unit of measure for small quantities of liquids, as in mixing medicines and in philosophical experiments, is the milliliter, equal to 16.23 minims.

A gallon is equal to 5.785 *l.*, and 2.8375 bush. make a *Hl.*

Metric Weight.

10 milligrams (*mg.*)	=	1 centigram, (*cg.*)
10 centigrams	=	1 decigram, (*dg.*)
10 decigrams	=	1 gram, (*g.*)
10 grams	=	1 dekagram, (*Dg.*)
10 dekagrams	=	1 hektogram, (*Hg.*)
10 hektograms	=	1 kilogram or kilo, *Kg.*
1000 kilos	=	1 tonne, (*T.*)

NOTE 1.—The *gram* is equal to 15.4323 grains, the *kilo* to 2.2046 lb. avoirdupois, and the *tonne* to 2204.6 lb. avoirdupois. *Tonne* is rarely used, the number of *kilos* being preferable.

The weight of one *cubic centimeter* of pure water at its greatest density (39 2° Fahrenheit) is a *gram*; the weight of a *cubic decimeter*, or a *liter*, of water at the same temperature is a *kilogram*, or a *kilo*, and the weight of a cubic meter of water is a *tonne*.

The original 5-cent nickel weighs 5 grams, and is 2 centimeters in diameter.

Equivalents.

Metre	= 39.37 inches (3¼ ft. nearly).
Kilometre	= .62138 mile (⅝ nearly).
Square metre	= 1.196 square yards (1 1-5 nearly).
Cubic metre	= 1.308 cubic yards (1 1-3 nearly).
Litre	= 1 cu. dm.
	= 1.0567 liquid quarts (1 nearly).
	= .908 dry quart (.9 nearly).
Kilogram	= The weight of 1 cu. dm. of water at 29.2 Fah.
	= 2.2046 pounds av. (2 1-5 nearly).
Hektare	= 10,000 sq. m.
	= 2.471 acres (2½ nearly).
Stere	= 1 cu. m.
	= .2759 cord (3-11 nearly).

Miscellaneous Tables.

Linear Measures.

3 barley-corns, or sizes	= 1 inch.	Used by shoemakers.
4 inches	= 1 hand.	Used to measure the height of horses at the shoulder.
21.888 inches	= 1 sacred cubit.	
6 feet	= 1 fathom.	Used to measure depths at sea.
3 feet	= 1 pace.	
1.152⅔ common miles	= 1 geog. mi.	Used to measure distances at sea.
3 geographic miles	= 1 league.	

Book Measure.

A sheet folded into	*The book is*	*A sheet of paper makes*
2 leaves	a folio,	4 pp. (pages)
4 "	a quarto or 4to,	8 "
8 "	an octavo or 8vo,	16 "
12 "	a duodecimo or 12mo,	24 "
16 "	a 16mo,	32 "
18 "	an 18mo,	36 "

The weight of a bushel of certain articles is as follows:

Barley,	48 lb.	Hemp seed,	44 lb.
Beans,	60 "	Oats,	32 "
Buckwheat,	42 "	Onions,	60 "
Bran,	20 "	Peas,	60 "
Corn,	56 "	Potatoes,	60 "
Corn meal,	50 "	Rye,	56 "
Corn in ear,	68 "	Salt,	56 "
Clover seed,	60 "	Timothy seed,	45 "
Flax seed,	56 "	Wheat,	60 "

Miscellaneous Weights and Measures.

100 lb. of grain or flour	= 1 cental.
100 " dry fish	= 1 quintal.
100 lb. of nails	= 1 keg.
196 " flour	= 1 barrel.
200 " beef or pork	= 1 barrel.
240 " lime	= 1 cask.
280 " salt at N. Y. Salt Works	= 1 barrel.
Keg powder,	= 25 pounds.
Stone of lead or iron	= 14 pounds.
Pig " "	= 21½ stone.

Anthracite coal, broken, cubic foot averages 54 lbs.

A ton, loose, occupies 40 to 43 cubic feet.

Bituminous coal, broken, cub. ft. averages 49 lbs.

A ton, loose, occupies 40 to 43 ft.

Cement (Hy.) Rosendale,	Bush.	= 70 lbs.
" " Louisville,	"	= 62 "
" " Portland,	"	= 96 "
Gypsum, ground,	"	= 70 "
Lime, loose,	"	= 70 "
" well shaken,	"	= 80 "
Sand at 98 lbs. per cu. ft.	"	= 122½ "

18.29 bush. = ton 1.181 ton = cu. yd.

A cable's length	= 240 yards.
20 articles	= 1 score.
12 dozen	= 1 gross.
12 gross	= 1 great gross.
A cord of wood	= 128 cubic feet.
1 hand	= 4 inches.
1 span	= 9 inches.

Shoemaker's Measure.

No. 1, of small size is 4⅛ inches long.

No. 1, of large size is 8 11-24 inches long.

Each succeeding number of either size is ⅓ of an inch additional length.

60 pairs of shoes = 1 case.

An American Car Load

Of 20,000 lbs. would contain the following articles: 70 bbl. salt. 70 of lime. 90 of flour. 70 of whiskey. 200 sacks of flour. 6 cords of soft wood. 15 to 20 head of cattle. 50 to 60 head of hogs. 80 to 100 head of sheep. 6000 feet of solid boards. 340 bush. of wheat. 400 of corn. 680 of oats. 400 of barley. 360 of flaxseed. 360 of apples. 430 of Irish potatoes. 300 of sweet potatoes. 100 of bran. 130 to 190 barrels of eggs. 15,000 to 26,000 lbs. of butter. 200 kegs of nails.

On roads, with track in best condition, a car load is from 24,000 to 60,000 lbs.

Miscellaneous Equivalents.

231 cu. in.	= 1 gal. liquid measure.
268 4-5 "	= 1 gal. dry measure.
277.274 "	= 1 imperial gal. of Great Britain.
2150.42 "	= 1 bushel of U. S.
2216.192 "	= 1 " " Great Britain.
2747.7 "	= 1 heaped bushel
1000 oz. or 62½ lb.	= 1 cu. ft. of pure water.
8 1-3 lb. pure water	= 1 gallon.
5760 grains	= 1 lb. Troy or apothecaries'.
7000 "	= 1 " avoirdupois.
24.75 cu. ft.	= 1 perch of masonry.
36 to 45 cu. ft.	= 1 ton anthracite coal.

Bible Weights and Measures.

A day's journey	=	33 1-5 U. S. miles.
A Sabbath-day's journey	=	1 " mile
Ezekiel's reed	=	11 feet nearly.
Cubit—Hebrew	=	22 inches, nearly.
" Greek	=	18 " about.
A finger's breadth	=	1 inch, "
A shekel of silver	=	62½ cents.
A " gold	=	$8.09.
A talent of silver	=	$1,518.32.
" gold	=	$23,309.
A piece of silver	=	13 cents.
A farthing	=	3 "
A gerah	=	2½ "
A mite	=	1½ mills.
A homer (as dry measure)	=	11 1-9 bushels.
A " (" liquid ")	=	70 gallons and 5 pints.
An ephah or bath	=	7 " " 4 "
A bin	=	1 gallon " 2 "
A firkin	=	7 "
An omer	=	6 "
A cab	=	3 "
A log	=	¾ "

Capacity of Cylindrical Cisterns.

The following table shows the capacity in gallons for one foot in depth of cylindrical cisterns of any dimensions. Find the diameter of any given cistern and multiply the number of gallons for one foot by the depth of the cistern, and you will have its volume in gallons:

Diameter.	Gallons.	Diameter.	Gallons.
2 feet	19	6½ feet	206
2½ feet	30	7 feet	239
3 feet	44	8 feet	313
4 feet	78	9 feet	396
4½ feet	99	10 feet	489
5 feet	122	11 feet	592
6 feet	176	12 feet	705

Mensuration; or, Useful Rules for Computing Measurements.

Area of a triangle = base × ½ altitude.

Area of a parallelogram, multiply base by altitude.

Area of a trapezoid = altitude × ½ the sum of parallel sides.

Area of a trapezium = divide into two triangles and find area of the triangles.

Circumference of circle = diameter × 3.1416.

Diameter of circle = cicumference × .3183.

Area of circle = square of the diameter multiplied by .7854.

Area of circular ring = diameters of the two circles × difference of diameter and that product by .7854.

Side of square that shall equal area of circle = diameter × .8812 or circumference × .2821.

Diameter of circle that shall contain area of a given square = side of square × 1.1284.

Surface of cylinder or prism = area of both ends + length × circumference.

Contents of cylinder or prism = area of end × length.

Surface of sphere = diameter × circumference.

Contents of sphere = diameter³ × .5236.

Contents of pyramid or cone = area of base × ⅓ altitude.

Surface of frustum of cone or pyramid = sum of circumference at both ends × slant height + area of both ends.

Contents of frustrum of cone or pyramid = multiply areas of two ends together and extract square root. Add to this root the two areas and × ⅓ altitude.

Contents of a wedge = area of base × ½ altitude.

Lumber and its Measurement.

A board foot is 1 foot long, 1 foot wide, and 1 inch thick, and is used as the unit of measurement.

What is called *scantling lumber* is 3 or 4 inches wide, and from 2 to 4 inches thick. *Joist* is usually narrow and deep. When lumber is heavier than joist or scantling it is called *timber*. Thick boards are called *planks*. The usual outside covering of wooden houses is *siding*.

If lumber is less than 1 inch in thickness it is considered as inch in computing the measurement. But a fraction greater than a half-inch is called an inch, and if less than a half it is rejected. A board 4 5-6 inches wide would be considered as 5 inches.

A board 16 feet long, 12 inches wide, and 1 inch thick would contain (16 × 12 × 1) ÷ 12, or 16 feet. A board 12 feet long, 14 inches wide, and 3 inches thick, would contain (12 × 14 × 3) ÷ 12, or 42 feet, board measure.

To find the number of board feet in any pile of lumber: Multiply the length in feet by breadth in feet and by thickness in inches, and the result by number of boards.

To Compute Volume of Square Timber.

When all the dimensions are in feet:

Rule. Multiply the breadth by the depth and that product by the length, and the product will give the volume in cubic feet.

When either of the dimensions are in inches:

Rule. Multiply the length, breadth and depth and divide by 12.

When any two of the dimensions are in inches:

Rule. Multiply the length, breadth and depth and divide by 144.

To Measure Round Timber take the girth in inches at both the large and small ends, add them, divide by two, which gives the mean girth; then multiply the length in feet by the square of one-fourth of the mean girth, and the quotient will be the contents in cubic feet. This rule is commonly adopted, and gives four-fifths of the true contents, one-fifth being allowed to the purchaser for waste in sawing.

BOOK IV.

INSPIRING LESSONS

FROM THE LIVES OF SUCCESSFUL MEN. THEIR ADVICE, EXPERIENCE AND MAXIMS . . . . .

A PRACTICAL STUDY OF THE ESSENTIAL QUALIFICATIONS FOR SUCCESS AS EXHIBITED IN THE LIVES AND CAREERS OF THE WORLD'S FAMOUS MEN IN ALL WALKS OF LIFE. THEIR MAXIMS AND ADVICES WITH RULES OF LIVING FOR THE USE AND DIRECTION OF ALL YOUNG PEOPLE.

HOW SUCCESS HAS BEEN WON
AND HAPPINESS ACHIEVED

THE POSSIBILITIES FOR ENTERPRISE

Andrew Carnegie's Great Career. Coming to this country as a lad from Scotland, a stranger in a strange land, Andrew Carnegie early found work as a messenger boy, and then as telegraph operator. By intelligence and push he became bridge builder, railroad manager and the head of great iron industries. Finally as philanthropist he founded libraries and endowed educational institutions. His life illustrates the possibilities open to honest effort.

INSPIRING LESSONS FROM THE LIVES OF SUCCESSFUL MEN, THEIR ADVICE, EXPERIENCE AND MAXIMS

SUCCESS is a broad word, with many meanings to many men. Our dictionaries may give it a single definition, but our lives and struggles will give it a dozen or a score of meanings. The meaning changes with the man. What is success to one is failure to another. What to one may be the summit level of progress, to another, of different aim, may be the depth of degradation. All depends upon our aim and purpose. He who aims the highest brings down the noblest game. He who aims low may hit his mark the easier, but what he hits is often not worth the effort. The climber who strives for the peak may not reach it, but he will get higher than he who sets out for a lower goal.

Come to the Subterraneous Barber
He shaves for a Penny.
RICHARD ARKWRIGHT.
FATHER of the COTTON INDUSTRY
Started as a BARBER'S APPRENTICE.

Success is not Measured by Gold, Fame or Position.

There is very little connection between the getting of money and real success. Success is a growth ; it is the unfolding of the divine nature of man, of all that is godlike within him. A man may succeed in piling up millions but fail in this higher development, fail in the supreme object of life on earth. Some of the most pitiful failures in the United States are millionaires. They have their money, but have nothing else. They lack health, happiness, nobility of purpose, breadth of view, capacity for enjoyment. They have obeyed Iago's injunction, "Put money in thy purse," but in the effort have put nothing beyond the thirst for money in their souls. Money has its virtue and its value, but the scramble for money as life's sole end is a labor without virtue or value.

The High Road of Happiness is Open to Every One.

What does man most want in this world? What does he live for, strive for, fight for? What but happiness? That is the great aim of us all; enjoyment, pleasure, happiness, call it what we will, they are all names for the one thing. It is the highroad of happiness we are all seeking; but the paths toward it are many and hosts of us wander far from the track.

This man makes health the secret of happiness, that man makes wealth; one would win it through fame, another through fortune; to the one it is high living, to the other high getting; some seek it through power, control, dominion, others through humble self-content; many hope to find it in the paths of vice, many in the paths of virtue; myriads come near it, few attain it in full measure; of all the things men strive for upon earth, unalloyed happiness is the most difficult to attain. Yet it is the one thing which lies at the basis of all our efforts in life. We would all tread the highroad of happiness; but how few there are of us who succeed in this common aim.

An Old Saxon Chief's Idea of Success.

In old Saxon England of many centuries ago, when a meeting was being held in the King's hall, to consider the new Christian doctrines as compared with the old pagan faith, a white-haired chief arose and, in as wise words as were ever uttered, spoke forth this famous parable of human life:

"Thou mayest recollect, O King, a thing which sometimes happens in the days of winter, when thou art seated at table with thy Eldermen and Thanes, when a good fire is blazing, when it is warm in thy hall, but rains, snows, and storms without. Then comes a little bird, and darts across the hall, flying in at one door and out at the other. The instant of this transit is sweet to him, for then he feels neither rain nor hurricane. But that instant is short; the bird is gone in the twinkling of an eye, and from winter he passes forth to the winter again. Such, to me, seems the life of man on this earth; such its momentary course compared with the length of time that precedes and follows it."

The chief spoke wisely, for he had all eternity before his mind's eye. But life needs to be considered as well as eternity. Life on the earth is brief as compared with the past and the hereafter; but it is long to us. The vista of our earthly career spreads out far before us, and we have happiness to strive for here as well as to prepare for hereafter. Success and happiness—these are the two great words with which we have to deal, these the two great things for which we strive from end to end of life. Some of us find them; many of us fail; it is the elements of success and failure in this search for happiness at home and abroad with which we are here concerned.

"God Helps Him Who Helps Himself."

How shall a man help himself? He must do it by working like one who loves his work, by bearing in mind the interests of his employer as well as his own, by industry and activity, by taking just advantage of every opportunity but unjust advantage of nothing and no person, by keeping in mind five words beginning with E:—*Education*, *Enterprise*, *Enthusiasm*, *Energy* and *Economy*.

He must make the most of his native ability, get in the right track and keep there, study himself and follow the path for which nature intended him, do his duty in all situations, place honor above profit, be daring but be wise and self-controlled, and give the best that is in him to every task which he undertakes. Those who follow these rules can scarcely fail to reach some level of success. The history of industry is full of the names of men who, by obeying such maxims, rose from the bottom to the top. So many are they, indeed, that we can make only a selection from them. We give some from English history.

A Procession Climbing the Hill of Success.

Here is a striking fact: From the barber's shop rose Sir Richard Arkwright, the inventor of the spinning-jenny and the founder of the English cotton industry,

Lord Tenterden, a very distinguished Lord Chief Justice of England, and Joseph M. Turner, the greatest of English landscape painters.

The humble class of day-laborers gave us Brindley the engineer, Cook the navigator, and Burns the poet. Masons and bricklayers can boast of Ben Jonson the dramatist, who worked at the building of Lincoln's Inn, with a trowel in his hand and a book in his pocket, Edwards and Telford the engineers, Hugh Miller the geologist, and Allan Cunningham the writer and sculptor. Among distinguished carpenters we find the names of Inigo Jones the architect, Harrison the chronometer-maker, John Hunter the physiologist, Romney and Opie the painters, and Gibson the sculptor.

We could give other examples from the weavers, the shoemakers and the tailors. From the latter came Admiral Hobson, one of the bravest of British seamen. He was working on the bench as a tailor's apprentice when a squadron of war vessels came near his native town. Suddenly eager to become a sailor, he sprang into a boat, rowed to the admiral's ship, and was accepted as a volunteer. Years after, he returned to his native village full of honors, and dined off bacon and eggs in the cottage where he had worked as a tailor's apprentice.

A Baker Who Mixed Brains with His Flour.

Sir Roderick Murchison discovered at Thurso, in the far north of Scotland, a profound geologist, in the person of a baker there, named Robert Dick. When Sir Rhoderick called upon him at the bakehouse in which he baked and earned his bread, Robert Dick delineated to him, by means of flour upon a board, the geographical features and geological phenomena of his native county, pointing out the imperfections in the existing maps, which he had ascertained by traveling over the country in his leisure hours. On further inquiry, Sir Roderick ascertained that the humble individual before him was not only a capital baker and geologist, but a first-rate botanist. "I found," said the Director-General of the Geographical Society, "to my great

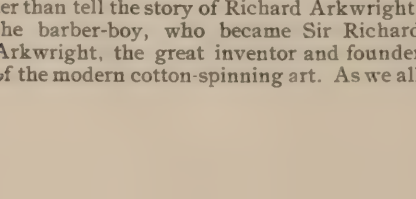
humiliation, that this baker knew infinitely more of botanical science, aye, ten times more, than I did; and that there were only some twenty or thirty specimens of flowers which he had not collected. Some he had obtained as presents, some he had purchased, but the greater portion had been accumulated by his industry, in his native county of Caithness; and the specimens were all arranged in the most beautiful order, with their scientific names affixed."

Shining Lights Stand at the Top to Beckon Us to Follow.

We need but suggest that Cardinal Woolsey, De Foe, Akenside, and Kirke White, were the sons of butchers; Bunyan was a tinker, and Joseph Lancaster a basket-maker. Among the great names identified with the invention of the steam-engine are those of Newcomen, Watt, and Stephenson; the first was a blacksmith, the second was a maker of mathematical instruments, and the third was an engine-fireman. Herschel played the oboe in a military band. Chantery was a journeyman carver, Etty a journeyman printer, and Sir Thomas Lawrence the son of a tavern-keeper. Michael Faraday, the son of a poor blacksmith, was in early life apprenticed to a bookbinder, and worked at that trade until he reached his twenty-second year; he grew to occupy the first rank in natural science.

AN ENGLISH BARBER'S APPRENTICE BECOMES THE FATHER OF THE COTTON INDUSTRY

THE YOUNGEST OF THIRTEEN CHILDREN OUTSHINES THE OTHER TWELVE .·. .·.



Before Richard Arkwright's great inventions were made the making of cotton thread and weaving of cloth was largely done by hand or on clumsy machinery.

To illustrate the principles of push and perseverance in industry, we cannot do better than tell the story of Richard Arkwright, the barber-boy, who became Sir Richard Arkwright, the great inventor and founder of the modern cotton-spinning art. As we all know cotton-spinning is one of the greatest of modern industries, and has been made so by the improvement in the machinery used to make cloth from the raw material.

Richard Arkwright, like most of our great mechanicians, sprang from the ranks. He was born in Preston in 1732. His parents were very poor, and he was the youngest of thirteen children. He was never at school; the only education he received he gave to himself; and to the last he was only able to write with difficulty. When a boy, he was apprenticed to a barber, and after learning the business, he set up for himself in Bolton in 1760, occupying an underground cellar, over which he put up the sign, "Come to the subterraneous barber,—he shaves for a penny." The other barbers found their customers were leaving them, and reduced their price to his standard; when Arkwright, determined to push his trade, announced his determination to give "A clean shave for a half-penny." After a few years he quitted his cellar, and became an itinerant dealer in hair. At that time

wigs were worn, and this was an important branch of the barbering business. Arkwright invented a new chemical hair-dye, which he used adroitly, and thereby secured a considerable trade.

Neglecting Business is Sure to Lose Trade.

Being of a mechanical turn, he devoted a good deal of his spare time to contriving models of machines, and, like many self-taught men of the same bias, he endeavored to invent perpetual motion. He followed his experiments so devotedly that he neglected his business, lost the little money he had saved, and was reduced to great poverty. His wife—for he had by this time married—was impatient at what she conceived to be a wanton waste of time and money, and in a moment of sudden wrath she destroyed his models, hoping thus to remove the cause of the family privations. Arkwright was a stubborn and enthusiastic man, and he was provoked beyond measure by this conduct of his wife, which he never forgave. As he could not live with her and carry out his plans, he separated from her. A man made like him had no use for a wife of that sort.

Queer Notions and Obstinacy Bring Sad Experiences.

Arkwright soon gave up his perpetual-motion hobby. He met a man named Kay, who told him about the inventions that had been made to spin cotton by rollers, and he at once saw fortune in the idea. He quit dealing in hair and began to work on a machine of this kind. But he soon found that the work was dangerous in a manufacturing district. The working classes in those days hated inventions, fearing that each new machine would rob them of labor and bread. A few years before they had torn to pieces Hargreaves's spinning jenny. They began to look sourly on Arkwright's labors, and he was wise enough to pack up his model and leave for a safer place.

He went to Nottingham, and here he got some bankers to lend him money. A patent was secured in the name of "Richard Arkwright, of Nottingham, clockmaker,"

ELIHU BURRITT
MASTERED many languages
while working as a BLACK-
smith at his forge.

and it is an interesting fact, that it was taken out in 1769, the same year in which Watt secured the patent for his steam-engine. A cotton-mill was first erected at Nottingham, driven by horses; and another was shortly after built, on a much larger scale, at Cromford, Derbyshire, turned by a water-wheel, from which circumstance the spinning-machine came to be called the water-frame.

Patience and Perseverance Produce a Fortunate Outcome.

But success was only secured by long and patient labor. The machine was far from perfect, and for some years the speculation was disheartening and unprofitable, swallowing up a very large amount of capital without any result. When success began to appear more certain, the Lancashire manufacturers fell upon Arkwright's patent to pull it in pieces, as the Cornish miners fell upon Boulton and Watt, to rob them of the profits of their steam-engine. Arkwright was denounced as the enemy of the working people; and a mill which he built near Chorley was destroyed by a mob in the presence of a strong force of police and military. The Lancashire men refused to buy his materials, though they were the best in the market. Then they refused to pay for the use of his machines, and combined to crush him in the courts of law. To the disgust of right-minded people, Arkwright's patent was upset. But though beaten, he was not subdued. He established large mills in other parts of Lancashire, in Derbyshire, and at New Lanark, in Scotland. The mills at Cromford also fell into his own hands at the expiring of his partnership with Strutt, and the amount and the excellence of his products were such, that in a short time he obtained so complete a control of the trade, that the prices were fixed by him, and he governed the main operations of the other cotton-spinners.

Fifty Years of Age is not too Late to Learn

Arkwright, from the first, was a tremendous worker, and a man of marvelous energy, ardor, and application in business. At one period of his life he was usual engaged, in the severe and continuous labo involved by the organization and condu of his numerous manufactories, from fo in the morning until nine at night. At fif years of age he set to work to learn Englis grammar, and improve himself in writi and orthography. When he traveled, save time, he went at great speed, drawn four horses. Be it for good or for evil, Ar wright was the founder in England of t modern factory system, a branch of indu try which has unquestionably proved source of immense wealth to individua and to the nation.

Many Americans Who Have Climbe to Fame and Fortune.

The history of industry in America beg later than in Europe, but it is full of t names of men who began at the bottom a climbed to the top. A few of these mu serve as examples of the whole. One the first and most famous of them is that Benjamin Franklin, the poor printer's a prentice, who rose to be one of the greate of scientists, statesmen, and men of pra tical affairs. If we take the gathering great wealth as one phase of success, may go back to the most famous of o early millionaires, Stephen Girard, who b gan his career as a sailor and ended as t wealthiest man of his time in America.

Industry and Enthusiasm Make Eli Burritt a Famous Blacksmith.

Elihu Burritt, the blacksmith, becam one of the most learned linguists by stud ing languages in the minutes he could ste from the forge, and in time he learn eighteen languages and twenty-two dialec It was not genius, but industry and enth siasm that made him learned and famou One of the choicest instances of battli against difficulties was that of Abraha Lincoln, the poor farm-boy, who graduat as a rail-splitter, and rose to be preside of the United States. Garfield by t great qualities of determination and stea plodding endeavor rose from the humb post of mule-driver on the canal to the sa exalted office.

Necessity is the Mother of Invention.

Benjamin West, the most noted of our early painters, began his work in a garret, and robbed the family cat of hairs to make his brushes. Daniel Webster was not a dunce at school, but one thing he could not do, he could not speak before the school. He was scared out of his wits at the bare thought. The teacher who begged him in vain to try would have smiled in derision if told that his silent scholar would become America's greatest orator. Henry Clay, his ablest rival, began as a poor, barefooted mill boy, who practiced oratory in the cornfield, the forest and the barn.

The Cobbler and the Farmer's Boy.

Henry Wilson, the shoemaker's apprentice, who became Vice-President of the United States, was working hard when twenty-one years of age, as a wood-chopper and teamster. Thurlow Weed, the editor and orator, began life as a farmer's boy, and did his early reading while tending "sap bush" in a maple-sugar camp. He read in this way a history of the French Revolution, which he had borrowed "after a two-mile tramp through the snow, shoeless, my feet swaddled in remnants of a rag-carpet." James Brooks, another notable editor, began as clerk in a village store, in which, luckily for him, the town library was kept. Here he learned enough to fit him out as a school-teacher, his first step in the path upward.

These are given as simply a few examples of Americans who have risen, by force of sheer industry and determination, from the bottom to the top of their special careers. Many others might easily be given. Every community has shining examples of success which have crowned honest, intelligent and courageous work. If you would seek for examples look around and analyze the lives of your leading men and women. If we were to seek among living millionaires numerous, striking instances of rising through sheer force of native ability and energy could be adduced, but those named will serve as passing examples of the results of indefatigable effort and favoring opportunity.

Sage Adivce and Wise Maxims of the Great Benjamin Franklin.

Benjamin Franklin has justly been called the "Many-sided Franklin," for no man ever had a greater diversity of gifts. He was an adept in a dozen fields. He succeeded admirably as a business man, a scientist, a diplomatist, a patriot, a statesman, and an originator of new enterprises. And his practical wisdom was lightened by a vein of quaint humor which at times appeared in the most serious situations. His "Poor Richard's Almanac" is essentially a comic publication—one of the first in America. But it owed much of its great popularity to its maxims of homely wisdom, which were the pith of Franklin's native good sense.

These maxims were of the kind that any man could follow to advantage. As evidence of this we may quote from the life of John Paul Jones. The splendid work which Captain Jones did with his ship, the *Ranger*, on the English coast is well known. It made him the lion of the day in France, and led to the promise of a squadron with which he could continue to ravage the British seas. But the ships were long in coming. Days, weeks, months passed and the impatient sailor chafed in vain. He wrote, he implored, he sought influential aid, but still delay was the order of the day. While thus worn out with eagerness and disappointment, he one day opened a copy of "Poor Richard's Almanac" and read in it this sentence: "If you would have your business done, go; if not, send." Here was an inspiration. Acting on the hint, Jones went at once to Versailles and in a brief time swept aside the cobweb of delay and obtained an order to purchase that vessel which in gratitude to Franklin he named the *Bon Homme Richard*, and which he was to make one of the most famous among ships.

With this example of the effect of their good advice in one instance, we shall proceed to quote from "Poor Richard's Almanac" some of Franklin's wise and often witty apothegms:

"God helps them that help themselves."

"A word to the wise is enough."

"A penny saved is a penny earned."

"Three things are men most likely t
be cheated in, a horse, a wig, and a wife.

The proof of gold is fire; the proof o
a woman, gold; the proof of man,
woman."

"A new truth is a truth; an old erro
an error."

"Love well, whip well."

"There is no little enemy."

"Necessity never made a good bar
gain."

"Drink water; put the money in you
pocket, and leave the dry belly-ache in th
punch-bowl."

"Keep thy shop and thy shop will kee
thee."

"Deny self for self's sake."

"Here comes the orator with his floo
of words, and his drop of reason."

"An old young man will be a youn
old man."

"Three may keep a secret, if two o
them are dead."

"Sal laughs at every thing you say
why? because she has fine teeth."

"Forewarmed, forearmed."

"He is no clown that drives the plough
but he that does clownish things."

"Fish and visitors smell in three days."

"Diligence is the mother of good luck."

"Let thy maid-servant be faithful
strong, and homely."

"Wealth is not his that has it, but hi
that enjoys it."

"He that can have patience can hav
what he will."

"Don't throw stones at your neighbors
if your own windows are glass."

"Let no pleasure tempt thee, no profi
allure thee, no ambition corrupt thee, no
example sway thee, no persuasion mov
thee, to do anything which thou knowest to
be evil; so shalt thou always live jollily
for a good conscience is a continual Christ
mas."

Here we have some fair examples of the everyday wisdom of Dr. Franklin. No that these maxims were all his own; mos of them were borrowed from older writers but he rarely borrowed without so changing the loan as to give it new value.

A PRINTER'S DEVIL BECOMES A GREAT STATESMAN

THRIFT, INDUSTRY AND COMMON SENSE THE BASIS OF SUCCESS IN THE EIGHTEENTH CENTURY AND IN THE TWENTIETH.

In the year 1706, now nearly two hundred years ago, there was born in a humble home in Boston a boy who was to become one of the movers of the world. Nobody could have had, to all seeming, a smaller chance. He was one out of seventeen children of a poor candle-maker and soap-boiler, who must have been weighed down by the weight of his family. Of his brothers and sisters no one ever hears, but of this boy, Benjamin Franklin, the world still talks and will not soon cease. Their minds were made of common clay and his was of porcelain. His career was a case of honorable and earnest self-help. But it would not have helped him as it did if he had been of an ordinary, every-day type of mind.

A Desire for Learning Will Find a Way.

Young Franklin began when ten years old to work in his father's shop. He had been fond of books from his infancy, but he had little time or chance to read or learn, and in time he got so tired of this that he wanted to go to sea to escape from the soap-vats. To stop this, his father put him to learn the printer's trade with his brother James, who had a printing office and published a newspaper. Here was the true opening for a boy of his tastes. He now had access to books, and though he had to work hard all day, he would sit up most of the night to read. Thus he filled his mind with new ideas. And he soon began to write, composing short articles, to which he signed no name. These were printed in his brother's paper and were praised in his presence by gentlemen who had no idea that he was the author.

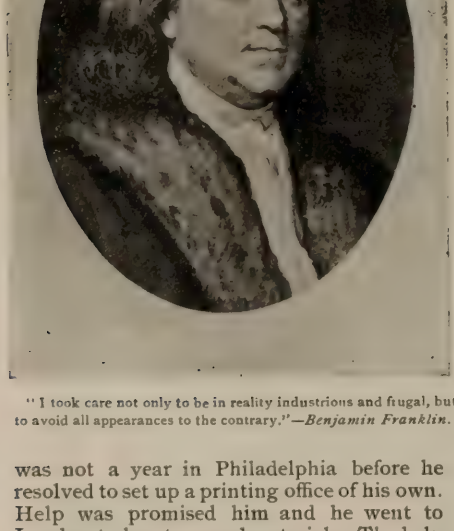
When seventeen years old young Franklin quarreled with his brother and set out to make his own way in the world. He reached New York in a vessel, and then walked across country to Philadelphia,

"Diligence is the mother of good luck."—*Franklin.*

which he entered munching at a roll of bread, two others under his arms and with his scanty wardrobe on his back and in his pockets. In that meager and adventurous way the runaway boy began his new life.

There is no Need to Remain at the Foot of the Ladder.

He was too energetic and enterprising to remain long at the foot of the ladder. He



"I took care not only to be in reality industrious and frugal, but to avoid all appearances to the contrary."—*Benjamin Franklin.*

was not a year in Philadelphia before he resolved to set up a printing office of his own. Help was promised him and he went to London to buy type and materials. The help did not come, but in a few years he was doing business for himself without it. And now he showed his grit and spirit. His office was open the first in the morning and was closed the last at night. He was his own carter, wheeling his goods in a barrow along the streets. Industry and economy were hi helpers, and soon his business began t thrive. In 1729 he bought a newspaper, th "Pennsylvania Gazette," which he soo made the best in the colonies. In 1732 h began to publish "Poor Richard's Alma nac," which was filled with useful informa tion, and maxims full of homely wisdom Everybody read his almanac as they did hi paper. In this and other ways Benjami Franklin soon had his feet on the highroa of success. He was making money an making reputation at the same time.

Support Everything That is for the Public Good.

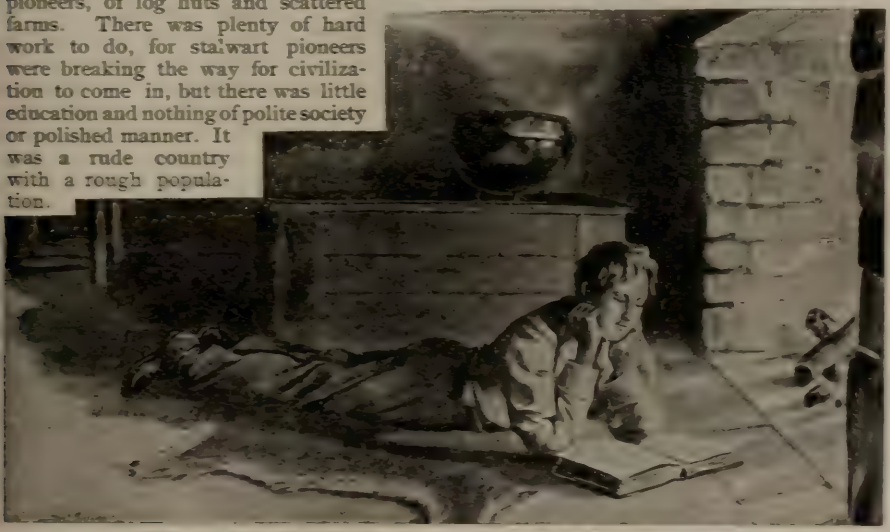
But Franklin as we would expect wa a man whom no business could hold pri oner. His mind was too active and his lo of learning too great for that. And he wa of an earnest public spirit that quickly mad him prominent in all that was going o Everything that was for the public good wa advocated and supported by him, and h his talents, prudence and integrity in a fe years he became one of the leading men the city of Philadelphia and the province Pennsylvania. By getting some of his rea ing friends to put all their books together fo general use he started the first library America—now the large and fine Philade phia Library. That was only one of th institutions which his adopted city owed his public spirit. Science in those days wa not very active, but he had an active intere in it, and by the simple aid of a kite an string he made the first great discovery the science of electricity. He proved th lighting is an electric agent. This was n his only discovery in science, but it was th most famous, and made the name of Frankl known as well in Europe as in America.

Thus, step by step, the boy who ha begun in the soap boiler's shop, made him self one of the most famous men in the worl When the war for Independence began the was no patriot more earnest than he. H was then too old to fight with his hands, bu he did better fighting with his head. He wa one of the men who signed the Declaratio of Independence. He died in 1790, his spir still lives in the hearts of his countrymen.

THE TURNING POINTS IN A GREAT CAREER

HOW THE ILLINOIS RAIL SPLITTER REACHED THE WHITE HOUSE.

The time was, much less than a century ago, when Illinois was still the Wild West, a land of forest and prairie, of red men and pioneers, of log huts and scattered farms. There was plenty of hard work to do, for stalwart pioneers were breaking the way for civilization to come in, but there was little education and nothing of polite society or polished manner. It was a rude country with a rough population.



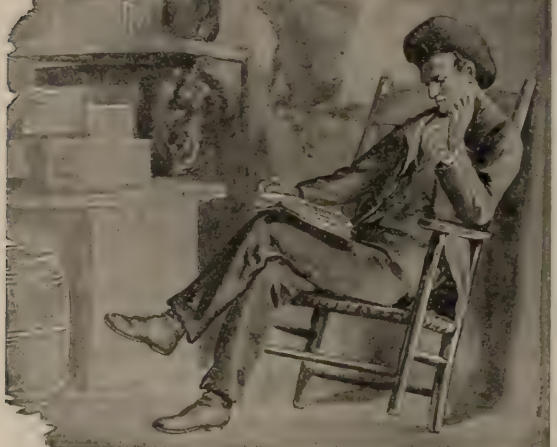
"If I master this book I shall be able to enter upon the study of law."—*Abraham Lincoln.*

A Piece of Charcoal and a Shovel are Enough.

Let us enter one of those primitive log cabins far out on the western prairie on a winter night. There is little furniture to be seen and the most meagre show of comfort and convenience. On a rough hearth blazes a cheerful wood-fire, the only bit of brightness in that frontier home, and crouched down in front of the fire is a roughly-dressed boy. His hair is tumbled, his face sunburnt and homely, his hands grimy, but there is a look of intense earnestness on his features and an honest and intelligent gleam in his deep eyes.

The boy is at school to himself. He is working out a problem in arithmetic, his slate being the back of a wooden shovel which he has scraped clean, his pencil a half-burned bit of charcoal from the fire. Beside him lie a book or two, which form his scanty library; for in that region, though

dollars are hard to get, books are harder still. But as the fire begins to smolder and the white smoke to ascend, it curls and wreathes itself until it takes on a shape in which a lively fancy might imagine the swelling dome of the Capitol at Washington. The boy does not see it. He is too busy with study to have time for fancy. And yet, if he knew it, that wreathing smoke is prophetic of his future career, for the boy's name is Abraham Lincoln and the White House and the Capitol are to be landmarks in his life journey. Little Abe Lincoln they call him now, but the sum he is working out on that wooden slate is the problem of his destiny.



"While keeping a country store Lincoln was completing his preparation for life's duties."

Good Nature and Fondness for Fun are Admirable Qualities.

Such was the boy. If we go forward some ten years we behold a new picture in Lincoln's career. He is grown up now, tall, stalwart, strong, agile. While he has been growing the country around him has been filling up with new people, but not one of them is Abe Lincoln's match. He has grown into a young giant, phys cally, mentally and morally. He can spl more wood, plough deeper, run faster, hu farther, and wrestle better than any boy man in the vicinity. A champion wrestle who tries to throw him by a trick, is flun like a log to the ground. Ever after th he is Lincoln's fast friend and follower. Fo strong as he is, the young champion is kind-hearted, so obliging, so just in h dealings and kindly in his spirit that one can help liking and respecting hir He is willing, good-natured, fond of fu ready when help is wanted, a the best story-teller of the whc region. His good stories a his amusing way of telling the are always safe for a hearty laug

Mentally, also, young Linco is head and shoulders above h fellows. He was studying whi they were playing, and his hom made school by the kitchen fi now shows its effect. He is vot the greatest scholar in the count round, and when any one is in quandary on some point of lear ing Lincoln is applied to, a rarely in vain. His moral stan ard is as high as his mental a his physical. Abe Lincoln's wo is his bond. He would rath take poison than tell a lie or a mean act. His soul is straight as a pine-tree, and behi his homely face dwells a beaut ful spirit. He treasures on one great indignation. That against the system of huma slavery. He has seen somethi of its workings in his two river trips dow the Mississippi, and looks upon it as a gre and growing wrong. "If I ever get a chan to hit slavery I will hit it hard," he say The time came in which he got his chan and kept his word.

A Man of Sterling Honesty is Admire by His Neighbors.

Let us look still further ahead, f another picture in Lincoln's life. He ha made himself a lawyer, and was wide known as the man who would not take

fee, however large, to defend an unjust cause. He had been sent by his admiring neighbors to the State Legislature, and afterward to Congress, where he became known to those about him as a man of sterling honesty, though not as a shining light in legislative halls. To the country at large his name was as yet almost unknown.

His first great effort was in 1854, when the "Rail Splitter" was pitted in debate against Stephen A. Douglas, the "Little Giant" of oratory in Illinois. Douglas was a famous orator, the champion of Democracy, and was advocating the Kansas-Nebraska bill for the repeal of the "Missouri Compromise." In answer to him, Lincoln first rose to his full height as an orator. A friendly editor said of his speech: "The Nebraska bill was shivered, and like a tree of the forest was torn and rent asunder by the hot bolts of truth. At the conclusion of this speech every man and child felt that it was unanswerable."

But it was in 1858 that Lincoln won national fame. He was again pitted against the "Little Giant," this time in a campaign for the office of United States Senator. The whole State was canvassed, the two orators following each other with telling speeches. Douglas was immensely popular. His advocacy of territorial expansion appealed to the young and ardent; his doctrine of popular sovereignty found many believers; he had a genius for debate; but Abraham Lincoln proved a powerful opponent, and ventilated many of his specious arguments by the hard bolts of solid logic.

"I Would Rather be Right Than be President of the United States."

Lincoln in his speech before the Republican Convention that nominated him for the Senatorship, fixed his position in a way that could not very well be misunderstood. It stated his heartfelt convictions in the plainest words. Some friends, to whom he showed the opening words of his speech, were frightened by their strength. "If you say that, your chances of election will be killed," they declared. "Your political prospects may be permanently ruined." "It is *true*, and I will speak it as written," he replied, "I would rather be defeated with those expressions in my speech held up and discussed before the people than be victorious without them."

Here is the paragraph in Lincoln's speech that defeated him for the Senatorship, but which, two years afterwards, made him President:

"'A house divided against itself cannot stand.' I believe that government cannot endure permantly half slave and half free. I do not expect the Union to be dissolved; I do not expect the house to fall; but I expect it will cease to be divided. It will become all one thing or all the other. Either the opponents of slavery will arrest the farther spread of it, and place it where the public mind shall rest in the belief that it is in the course of ultimate extinction, or its advocates will push it forward till it shall become alike lawful in all States, old as well as new, North as well as South."

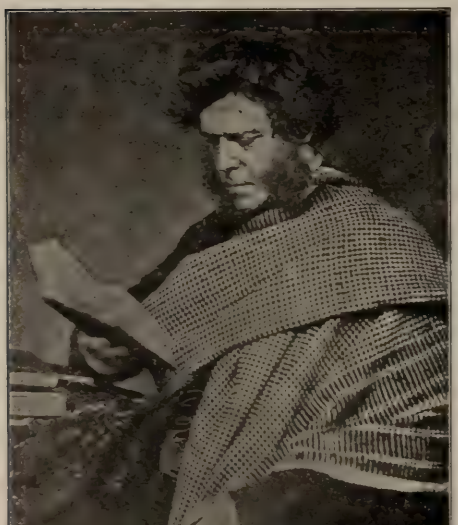
An Earnest and Intelligent Fight Against Wrong Will Win in the End.

There was no compromise in those words. They rang widely throughout the North, and made him the logical standard-bearer of all anti-slavery advocates. He nailed their sentiment in later words. A young negro from Springfield had been wrongfully detained in New Orleans, and was about to be sold for prison expenses. Lincoln in vain implored the Governor of Illinois to interfere. Moved to the depths of his soul by the Governor's refusal, the ardent advocate exclaimed: "By God, governor, I'll make the soil of this country *too hot for the foot of a slave!*"

He kept his word in 1863, when, as President of the United States, he signed the proclamation setting free all slaves in that territory in which an effort to overthrow the government in the interest of slavery was being made. Lincoln lived to see the Union saved, slavery abolished, his life-work accomplished, and manumitted slaves gathering around him in the streets of Richmond, the capital of the Confederate government. Then he fell by the hand of an assassin, but not before the seeds which had been planted in the homely Illinois cabin were ripened and had borne their destined fruit.

WINNING FAME WITH A HAMMER

A POOR SCOTCH BOY RISES TO BE A DISTINGUISHED AUTHORITY ON THE STORY OF THE ROCKS AND THE EARTH'S CRUST



Hugh Miller who rose from apprentice in the stone quarry to be the great college professor and authority on geology.

Success in life does not mean filling one's purse with gold. Some of the most successful men cared nothing for money. If they won it, it was not by working for it. They had higher aims, and such fortune as came to them was not sought for. Herschel, of whom we have spoken elsewhere, was a man of this sort. Another was Hugh Miller, the poor quarry boy, who rose to be a famous geologist and popular writer on science.

Hugh Miller was a Scotch boy, whose father was drowned at sea when Hugh was a child, leaving him to be brought up by his widowed mother. He had a school training of some sort, but his best teachers were the boys with whom he played, the men among whom he worked, and the friends and relatives with whom he lived. He read much, and gleaned pickings of odd knowledge from many odd quarters,—from workmen, carpenters, fishermen, sailors, and old women, and, above all, from the old boulders strewed along the shores of the Cromarty Frith. With a big hammer which had belonged to his great-grandfather, an old buccaneer, the boy went about chipping the stones, and thus collected specimens of mica, porphyry, garnet, and the like. Sometimes he had a day in the woods, and there, too, the boy's attention was excited by the peculiar geological curiosities which lay in his way. While searching among the stones and rocks on the beach, he was sometimes asked by the farm-servants who came to load their carts with sea-weeds, whether he "was gettin' siller in the stanes," but was never able to answer their question in the affirmative.

The Stone Quarry Becomes the School for a Bright Boy.

His uncles were anxious that he should become a minister; for it is the ambition of many of the aspiring Scotch poor to see one of their family "wag his pow in a poopit." These kind uncles were even willing to pay his college expenses, though the labor of

their hands formed their only wealth. But the boy did not feel *called* to the ministry, and the uncles gave up their point. Hugh was accordingly apprenticed to the trade of his choice,—that of a working stonemason; and he began his laboring career in a quarry looking out upon the Cromarty Frith. This quarry proved one of his best schools. The remarkable geological formations which it displayed awakened his curiosity. The bar of deep-red stone beneath, and the bar of pale-red clay above, were noted by the young quarryman, who even in such unpromising subjects found matter for observation and reflection. Where other men saw nothing, he detected analogies, differences, and peculiarities, which set him thinking. He kept his eyes and his mind open; was sober, diligent, and persevering; and this was the secret of his intellectual growth.

He Reads the Story of History Millions of Years Old.

His curiosity was excited and kept alive by the curious organic remains, principally of extinct species of fishes, ferns, and shells, which lay revealed along the coasts by the washings of the waves, or were exposed by the stroke of his mason's hammer. He never lost sight of this subject; went on accumulating observations, and comparing formations, until at length, when no longer a working mason, many years afterwards, he gave to the world his highly interesting work on the "Old Red Sandstone," which at once established his reputation as a scientific geologist. But this work was the fruit of long years of patient observation and research. As he modestly states in his autobiography, "the only merit to which I lay claim in the case is that of patient research,—a merit in which whoever wills may rival or surpass me; and this humble faculty of patience, when rightly developed, may lead to more extraordinary development of idea than even genius itself."

Bits of Wisdom for all Occasions

"What though you have found no treasure, nor has any rich relation left you a legacy. Diligence is the mother of good luck, and God gives all things to *industry*. Then plough deep while the sluggard sleeps, and you shall have corn to sell and to keep. Work while it is called to-day, for one to-day is worth two to-morrows."

"Good wives and good plantations are made by good husbands."

"There are three faithful friends, an old wife, an old dog, and ready money."

"He that would have a short Lent, let him borrow money to be repaid at Easter."

"Grace thou thy house, and let not that grace thee."

"Keep your eyes wide open before marriage; half shut afterwards."

"God heals, the doctor takes the fee."

"Who has deceived thee so oft as thyself."

"The noblest question in the world is, what good may I do in it?"

"Fly pleasures, and they'll follow thee."

"Hast thou virtue? Acquire also the graces and beauties of virtue."

"As we must account for every idle word, so we must for every idle silence."

"Search others for their virtues, thyself for thy vices."

"Let thy discontents be thy secrets."

"Let thy child's first lesson be obedience, and the second will be what thou wilt."

"Happy that nation, fortunate that age, whose history is not diverting."

"Industry need not wish."

"To bear other people's afflictions, every one has courage enough and to spare."

"There are lazy minds as well as lazy bodies."

"Tricks and treachery are the practice of fools, that have not wit enough to be honest."

"Work is the seed of worth."

"Honor is soundness; dishonor is hollowness."

"To do your duty is to be a hero."

"He who controls himself controls his fellows."

"Wait and trust and all will come round."

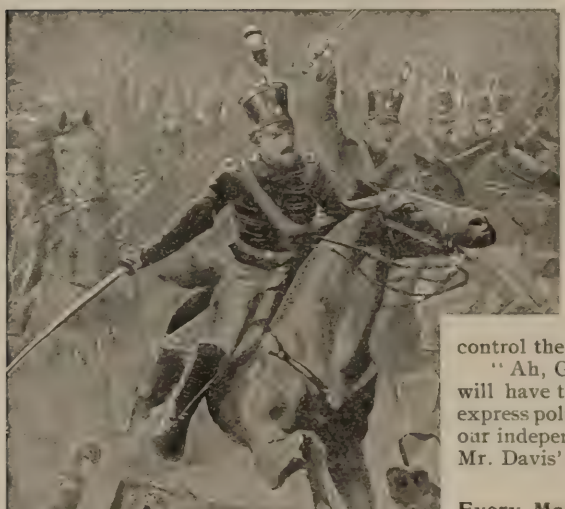
"A smile outweighs a dozen frowns."

"Kindness makes life's wheels run smoothly."

"Keep good company or none."

TWO MEN REACH FAME FROM OPPOSITE SIDES OF THE HILL

GENERAL LEE AND GENERAL GRANT DO THEIR DUTY AND ARE HONORED



"Robert E. Lee was always to be found where the fighting was the fiercest and the danger greatest."

It is an excellent thing to know one's powers and limitations. A failure in properly estimating these may make all the difference between success and failure in life. There, for instance, was General Lee, who knew that he was a soldier and that he was not a statesman, and who was wise enough to resist all suggestions leading in the latter direction. The Hon. H. H Hill, meeting him in Richmond during the last years o the war, said:

"General, I wish yo would give us your opinio of the propriety of changin the seat of government an going farther South."

"That is a political ques tion, Mr. Hill," Lee replied "and you politicians mus determine it. I shall endeavo to take care of the army, an you must make the laws, an control the government."

"Ah, General," said Mr. Hill, "yo will have to change that rule and form an express political opinions, for if we establis our independence the people will make yo Mr. Davis' successor."

Every Man Should Qualify Himself Fo Some Particular Work and Stick to it.

"Never, sir," replied the General, wit his habitual dignity of manner; "that shall never permit. Whatever talents may possess are military talents. My edu cation and training are military. I thin the military and civil talents are distinct, not different, and full duty in either sphe is about as much as one man can qualif himself to perform.

"Well, but General, history does no sustain your view. Cæsar and Frederic of Prussia and Bonaparte were great state men as well as great generals."

"And great tyrants," Lee promptly responded. "I speak of the proper rule in republics, where, I think, we should have neither military statesmen nor political generals."

"But Washington was both, and yet not a tyrant."

With a beautiful smile Lee responded, "Washington was an exception to all rule, and there was none like him."

Success in One Thing.

This evidence of self-knowledge and exhibition of self-abnegation were significant of the character of the man, and teach a lesson which few in Lee's position would have observed. The truly wise and patriotic man is he who has fully gauged his powers, and will not let ambition lead him to accept an office whose duties he feels himself incompetent to fulfil. On leaving the army General Lee became President of Washington College, a position needing some of the qualities which his military life had developed. Sarcasm was one of his weapons here, as is indicated in the following anecdote. A visitor asking him how a certain student was getting on, Lee replied in a tone of grave satire:

"He is a quiet, orderly young man, but seems very careful *not to injure the health of his father's son*. Last month his average in the languages was less than fifty, which is very low, as one hundred is our maximum. Now I do not want our young men to injure their health, *but I wish them to come as near it as possible*."

Here we have the principle of successful generalship applied to the business of college training.

Two great soldiers found the opportunity of their lives in the Civil War, Ulysses S. Grant and Robert E. Lee. They were men of different character, though alike in certain particulars. Both were modest, unassuming men, and, with all their military vigor, both were naturally kind and considerate. Grant had proved unfitted for a business life. Had it not been for the war he would never have become a hero of history. As a soldier he was unlike Lee, whose greatest successes were gained in defence, while those of Grant were won in offensive warfare. General Grant lacked the characteristic of self-assertion.

"I propose to move immediately upon your works."—*Gen. U. S. Grant.*

The Opportunity to Act Must Be Seized when It Comes.

When the war between the States began and a crowd of enterprising incompetents pressed to the front, he was put at duties suitable for a drillsergeant. But the moment he was given an opportunity to act, he showed the soldierly stuff that was in him. His wife had said that he was "a very obstinate man," and such he proved himself.

"We are surrounded." cried the alarmed men at Belmont, when they were in danger of being cut off from their boats.

"Well, then," said Grant, "we must cut our way out, as we cut our way in,"—and they did. It was the only retreat in his career.

At Fort Donelson his words sounded the keynote of his success, when he answered Buckner's demand for terms: "No terms but unconditional and immediate surrender can be accepted. I propose to move immediately upon your works." From that day on his name signified, to the people, "Unconditional Surrender Grant." It was the same after the first day's hot work at Shiloh, where Grant's army had suffered a terrible repulse and to all but the most sanguine of his advisers the battle seemed utterly lost. He settled the question of victory or defeat in his terse remark: "Well, it was rough work to-day, but we will beat them out of their boots to-morrow."

Words like these are significant of the indomitable spirit to which, in connection with a genius for handling large bodies of men, Grant owed the success of his career as a soldier. "The great thing about Grant," said Lincoln, "is his cool persistency of purpose. He is not easily excited, and he has the grip of a bull-dog. When he once gets his teeth in, nothing can shake him off."

The Grip of the Bull Dog is a Quality of Character Needed in a Crisis.

Such is the character he showed in the siege of Vicksburg; such that he displayed when, after crossing the Raritan, he ordered that all bridges but one should be destroyed. "If we have to come back," he said, "one bridge will be enough for all the army that will be left." Such is the spirit of his famous dispatch, written after six days of terrible fighting in the Wilderness and the country between there and Richmond: "I propose to fight it out on this line if it takes all summer." Such was the sentiment of Lee's remark when Gordon suggested that Grant was retreating: "You are mistaken; Grant is not retreating. *He is not a retreating man.*"

Did Grant make an error in doing what Lee declined to do, taking upon himself the duties of statesmanship? Some will say he did, others that he did not. There are exigencies in which stern generalship is needed in the Presidency, and here Grant was the man for the place. There are others in which business judgment of the highest character is demanded, and this he did not possess. His obstinacy was not of the type of that of Jackson, who was not open to suggestion or advice, and he thus avoided Jackson's mistakes, but his native kindness of heart led him into certain errors in action. Yet, aside from this, he filled the office with dignity and ability, his high sense of honor and justice carrying him safely over many perilous paths.

General Lee's Advice to His Son

"A farmer's motto should be 'Toil and Trust.'"

"You must study to be frank with the world; frankness is the child of honesty and courage. Say just what you mean to do on every occasion, and take it for granted you mean to do right."

"If a friend asks a favor, you should grant it if it is reasonable; if not, tell him plainly why you cannot; you will wrong him and wrong yourself by equivocation of any kind."

"Never do a wrong thing to make a friend or keep one; the man who requires you to do so is dearly purchased at a sacrifice."

"Above all, do not appear to others what you are not. If you have any fault to find with anyone, tell him, not others, of what you complain; there is no more dangerous experiment than that of undertaking to be one thing before a man's face and another behind his back."

"We should live, act, and say nothing to the injury of anyone. It is not only better as a matter of principle, but it is the path of peace and honor."

"Read history and works of truth—not novels and romances. Get correct views of life, and learn to see the world in its true light."

THE BOY OF THE CANAL BECOMES THE NATION'S RULER.

A GOOD EDUCATION GAINED AT A SACRIFICE OPENS THE WAY TO ADVANCEMENT AND LEADERSHIP.

Abraham Lincoln was brought up in the wilderness of Illinois; James Garfield, the second martyr President, in the wilderness of Ohio. At any rate, the place in which Garfield was born was known as "The Wilderness." Here his father had hewn a farm out of the great forest, and built a humble log-cabin in the clearing, and was in a fair way to make a good living. Then he lay down and died, leaving his wife to work the farm and raise her children the best she could—James being still in babyhood. He grew up on the farm, worked in the fields like a young Trojan, and, when old enough, got such meagre education as a little country school could give. In his reading, he grew so fond of Cooper's sea tales that he thought he would like to go to sea and have adventures himself. So at seventeen he went to Cleveland and accepted a position as a sailor on the lakes. But before the vessel was ready to sail, the boy's sea fever was cured. The sailors were such rough fellows and life on shipboard seemed so lacking in interest that all his romantic fancies fled, and he left the ship and the lake in disgust. So ended in failure Garfield's first venture in the wide world away from home.

Plenty of Ambition and Little of Money.

He was ashamed, however, to go home with an empty pocket and no adventures to relate, and hired out as a driver boy on the Ohio and Pennsylvania Canal. He knew far more about horses than ships, and did so well in this unromantic career, that at the end of the first trip he was promoted to the post of canal-boat steersman. This was dangerous work for a green hand. He had to stand on the edge of the boat and handle the rudder, and if it slipped was likely to plunge over the side. On his first trip he fell overboard no less than fourteen times, and, as he could not swim, had to be fished out of the water each time. One of these plunges took place on a dark rainy night, when there was nobody at hand to come to the rescue, and only his fortunate grasp of a dangling rope saved his life. On such small chances great careers often turn. These particulars of Garfield's early life are of interest, as showing its humble opening phase.

In the next year, 1849, we find our young Garfield at school in a seminary at Chester, Ohio. The desire for something better than a country school education was growing in his mind. He had plenty of youth, hope, and ambition, but very little money, so he and three boys similarly situated rented a room for a small price, and here did their own work, cooked their own food, ate, slept and studied. He persuaded his youthful companions that a meat diet was not necessary to the acquisition of knowledge or the preservation of health, so they lived mainly on bread, rice, milk and

"No young man who has good health and is master of his own actions can be excused for not obtaining a good education. Poverty is very inconvenient but it is a spur to activity."
—*Garfield.*

potatoes, providing their food for the small sum of about fifty cents a week each. During vacation Garfield went to work for a carpenter, and soon became a fair workman. He also did harvest work in the fields, and managed by his labor to pay his way for three years at the academy. For some two years more he sought an advanced education in a new school called Hiram College, paying his expenses by dint of teaching and working.

He Becomes a College President.

In 1853, grown eager through his own efforts for the elements of the higher knowledge, he entered Williams College, Massachusetts, and acquitted himself so well that on his graduation, he was made Professor of Languages and Literature at Hiram College, and the next year was made President of that institution. He held this Presidency for five years, much to the benefit of the college and the growth of his own reputation. Taking some part in politics as an orator he was nominated and elected to the Ohio State Senate, where in 1861, on the outbreak of the Civil War, he carried through a bill offering 20,000 soldiers and $3,000,000 in money for the cause of the Union.

This led Garfield to the career of a soldier, for which his reading had made him as eager as he formerly was for a sailor's life. He was offered and accepted the command of the Forty-second Ohio Regiment at whose head he soon proved himself a good soldier. With eleven hundred men he manœuvered so skillfully as to defeat Humphrey Marshall with five thousand, and drive him out of Kentucky. He afterward took a creditable part in the battle of Shiloh and aided General Thomas so effectively after the defeat of Chickamauga that he was promoted Major-General for distinguished services. Shortly afterward his admirers at home nominated and elected him to Congress and he left the battlefield for the field of legislation.

A Rare Political Career the Result of Sturdy Independence and Sound Judgment.

Garfield's subsequent story, as in other careers is not one of active incident but in his Congressional career he proved himself one of the ablest of legislators, and rose high in the respect of his party, the Republican. In 1877, when Blaine entered the Senate, Garfield succeeded him as leader of the House, and in 1880 he was chosen to represent Ohio in the Senate. But the great reward of his ability, integrity and energy came in June of that year, when he received the Republican nomination for the Presidency. He was elected in November, and

took his seat as head of the nation on March 4, 1881.

This was a remarkable rise for the boy of the log-cabin and the canal tow-path, one only second to that of his predecessor, Lincoln. The two were alike in rise and alike in their fate, for Garfield also fell by the assassin's hand, the victim of a national contest. There was no war now to stir up the passions of the populace, but there was something like a war among politicians and office-holders, in the bitter struggle to overthrow the policy of using the official positions of the country as places of reward for political workers. Garfield was strongly opposed to this practice and a warm advocate of civil service reform; the excitement roused by his attitude stirring to madness the weak brain of at least one disappointed office seeker.

On July 2, 1881, he set out from the White House to attend the closing exercises of Williams College, from which he had graduated twenty-six years before. While standing chatting with James G. Blaine, Secretary of State, in the railroad station, the assasin, Charles J. Guiteau by name, stepped up and shot him in the back. The President fell, fatally hurt, while the bystanders flung themselves on the murderer.

Garfield survived for three months, and bore the pain of his wound with a brave patience and cheerfulness that endeared him to the people. He died at Long Branch, New Jersey, on September 19th, universally mourned, for a nobler fight with pain and suffering and a more patient and forgiving spirit had rarely been seen. Thus James A. Garfield ended in martyrdom to the best interests of his country a career in which integrity, devotion to duty and nobility of character had been the distinguishing traits.

A Margin of Time Well Employed Often Determines a Man's Destiny

He succeeded also from the fact that all the world could not have kept him in the background, and because once in front, he played his part with an intrepidity and a commanding ease that were but the outward symptoms of the immense reserve of energy on which it was in his power to draw.

"When I was a freshman in Williams College," said Garfield, "I looked out one night and saw in the window of my only competitor for first place in mathematics a light twinkling a few minutes longer than I was wont to keep mine burning. I then and there determined to invest a little more time in preparation for the next day's recitation. I did so, and passed above my rival. I smile to-day at the old rivalry, but I am thankful for the way my attention was called to the value of a little margin of time, well employed. I have since learned that it is just such a margin, whether of time, or attention, or earnestness, or power, that wins in every battle, great or small."

Garfield's Wise Words

"During the twenty years I have been in public life (almost eighteen in the Congress of the United States), I have tried to do one thing. Whether I was mistaken or otherwise, it has been the plan of my life to follow my convictions at whatever personal cost to myself. I have represented for many years a district in Congress, whose approbation I greatly desired; but, though it may seem perhaps a little egotistical to say it, I yet desired still more the approbation of one person, and his name was Garfield. He is the only man that I am compelled to sleep with, and eat with, and live with, and die with; and, if I could not have his approbation, I should have bad companionship."

"Poverty is uncomfortable, as I can testify; but nine times out of ten the best thing that can happen to a youg man is to be tossed overboard, and compelled to sink or swim for himself. In all my acquaitance I never knew a man to be drowned who was worth the saving."

"Statesmanship consists rather in removing causes than in punishing or evading results. The man who wants to serve his country must put himself in the line of its leading thought; that is the restoration of business, trade, commerce, industry, sound political economy, hard money and the payment of all obligations; and the man who can add anything in the direction of accomplishing any of these purposes is a public benefactor."

HOW A STAGE DRIVER BECAME PRESIDENT OF THE WORLD'S GREATEST CORPORATION

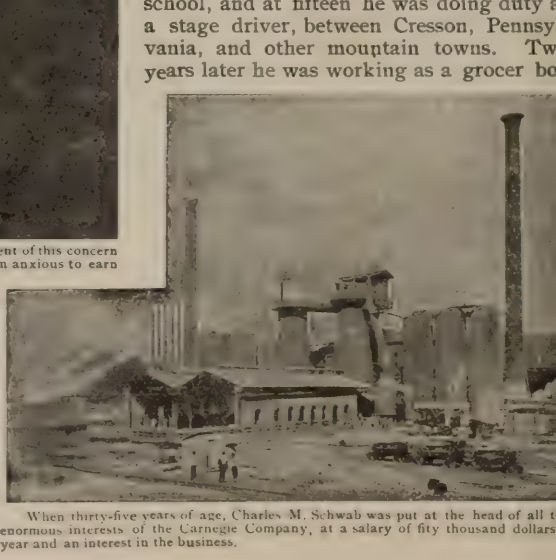
ENTERPRISE AND PUSH MIXED WITH COMMON SENSE MAKE CHARLES M SCHWAB THE BEST PAID MANAGER IN THE WORLD.

"If I get a chance, I mean to be the President of this concern some day. I will show my employer that I am anxious to earn promotion."—*Charles M. Schwab.*

It is the ability and readiness "to do things," to take hold when the time comes, that make men great. Charles M. Schwab, the President of the immense United States Steel Corporation, is a shining example of this kind of men. He was not born with a gold spoon in his life; not even with a brass one. He began his career at the foot of the ladder; it astonishing how short a time it took him t climb to the topmost round.

The First Chance that Comes is not Always a Promising One.

Mr. Schwab was one of those who begi life without a start, other than that whic nature provides in a strong body, an amb tious mind, and a vigorous will. He wa one of the sort who cannot be kept dow He had an education, of some sort, but th needs of life took him early away fro school, and at fifteen he was doing duty a a stage driver, between Cresson, Pennsy vania, and other mountain towns. Tw years later he was working as a grocer bo



When thirty-five years of age, Charles M. Schwab was put at the head of all t enormous interests of the Carnegie Company, at a salary of fity thousand dollars year and an interest in the business.

for two dollars and a half a week. But he was wide-awake, always keeping his eyes open for a chance and ready to grasp it when it came. The first chance that came to him was not a very promising one. It was simply that of a day laborer, at the wages of a dollar a day. An engineer corps was building works for the Carnegie Company, and men were wanted to drive stakes. Young Schwab was hired, and very likely thought himself lucky to get work at such wages. A dollar a day was more to him then than a dollar a minute would be now—and yet that was not very long ago. His rise to fortune has been wonderfully rapid.

It was not long before his energy and good work brought him a new and better chance, that of the position of an engineer. He was a good engineer, one of the kind who does all his duty and as much over as he can, and works for his employers rather than for himself. His earnestness, energy and ability were so marked that he was not long in reaching the post of chief-engineer. Fortunately the men for whom he worked were of the kind who value the sort of qualities he possessed and are quick to recognize them when they find them. Mr. Schwab was just the man they wanted. They could see that it was not for salary he worked so much as to make the most of every chance that came to him and do his best in every situation. Even when he was working for the Carnegie Company as a day laborer, he said: "If I get a chance, I mean to be the president of this concern some day. I will show my employer that I am anxious to earn promotion. I am going to do more than I am paid for,—more than is expected of me."

Make Yourself Invaluable and You Will be Recognized.

This spirit of determination carried him rapidly on. At twenty-five he was superintendent of the Homestead Steel Works. At thirty he was superintendent both of this and of the Carnegie Steel Company. From this period his upward climb was steady and rapid. He had made himself invaluable and his merit was fully recognized. It was he that made the Homestead Works the great establishment which it became. It was he that created the vast and profitable armor-plate branch of the Carnegie industry. He was always devising some new, better and cheaper way of doing things, and through every step of his career he distinguished himself for his exceptional ability.

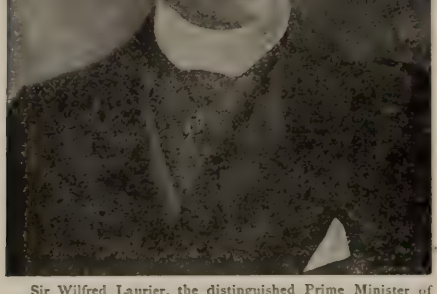
A man like this could not fail to rise. In 1897, when thirty-five years of age, he was put at the head of all the enormous interests of the Carnegie Company, at a salary of fifty thousand dollars a year and an interest in the business. Four years later, when the United States Steel Corporation was formed, his interest was valued at twenty-seven million dollars. He was then thirty-nine years of age. Twenty years before he had been driving stakes at a dollar a day, and glad to get that. In 1901, when the billion dollar Corporation was formed, he was made its President at a salary said to be the largest in the world. Such a lift of fortune as this for the stage-driver and grocer boy, had rarely been equalled in the history of the world.

Be Content to Work for Others or go into Business for Yourself.

Mr. Schwab was never a mere laborer; he always showed the spirit of a leader. It was his genius that made the Carnegie iron and steel mills the vast and profitable concerns they are to-day. His was not the kind of enterprise that is not satisfied without a great business of its own. He was content to work for others, and to climb the ladder of fortune by setting his feet on every round. Though the chief manager of a great iron industry, he has never been a man of iron. To his energy of character he adds cheerfulness, kindness and gentleness of spirit. His life-story is not alone fascinating, it is highly useful from the standpoint of example. He has introduced a cheerful optimism into his work, and never drives, but always leads. Great opportunities came to Mr. Schwab, and he was ready at every point to lay hold upon them. The real value of his career lies in the light it throws upon the possibilities which may come to that great class of wage-earners of which he has preferred to remain a member.

PERSONAL MERIT MAKES A PRIME MINISTER

SIR WILFRED LAURIER KNEW HOW TO USE NATURAL ADVANTAGES.



Sir Wilfred Laurier, the distinguished Prime Minister of Canada early in life determined, "to be somebody" and to rise to leadership upon his own merit. His is a brilliant example of a life of high ideals.

Graceful in manner, tall in figure, with erect form and strong handsome face, a sweet, sonorous voice, and the dignified bearing of one built to be a master of men, Sir Wilfred Laurier appears to all unbiased eyes a natural leader in any situation in which life may place him. There is no more picturesque figure in the public life of the Dominion of Canada, and his career represents a great change in opinion, that from the conservative rule so long and ably held by Sir John MacDonald to the supremacy of the Liberals. This change Laurier was one o the chief forces in bringing about.

Through all the English period th French element has continued prominent i Canada, preserving its old habits and lan guage as persistently as the Germans i Pennsylvania. But it has rarely been pre dominant in public affairs, and Laurier i the first French Canadian to rise to th Premiership—the virtual Presidency—o the Dominion.

An Ambition "to be Somebody" is Sure Sign of Success

For this reason, if for no other, a brie account of his career may be welcome Though of French origin, being the onl child of Carolus Laurier and Marcelle Mai tineau of Quebec, he received his earl training in a country school over whic presided a well-educated Scotchman, whos efforts to inspire him with an ambition "t be somebody" he has never forgotten. S impressed was he with his tutor that h made the declaration, later in life, that— he had not been born a Canadian—he woul have preferred being born a Scotchman At McGill University he was apt and studi ous and was a favorite with his teachers Yet his native trend of mind is shown b his going, without permission, to hear, i the village courthouse, the argument o cases or to applaud some political orator for which dereliction he was held to accoun by the college authorities. Studying law he practiced for three years in Montreal when, as his health showed signs of break ing down, he sought country air in the east ern townships of Quebec. Here, for a time

DEGENS MACHINE - 1812
MARCH MASON MODEL AERIAL MACHINE
AN AIR SHIP BY GENERAL B. FRANCIS LANA OF BRESCIA - 1670
A NAVIGABLE AIR SHIP OF 1844 THE FIRST STEAM CARRIAGE OF THE AERIAL TRANSIT COMPANY
BELL'S UNSUCCESSFUL EXPERIMENT AT VAUXHALL 1850
M SANTOS DUMONT
PETERS PATENT 1850
TWO CENTURIES
OF
AERIAL NAVIGATION
M. SANTOS DUMONT TESTING THE MOTOR OF HIS BALLOON

TRAVELING IN THE AIR

For many centuries inventors have endeavored to make machines which would navigate the air. The latest and most successful experimenter is Santos Dumont who is a Frenchman of Brazilian. He has succeeded in constructing an air ship which can be directed at will and which has made short voyages over Paris and the Mediterranean. Many believe that air ships capable of being steered will in the future be a common means of transportation.

he edited *Le Defricheur*, a Liberal journal. Later, with restored health, he resumed the practice of law at St. Christophe, now the town of Athabaskaville; in which pretty little place he continued to live until, in 1896, he took up his residence in Ottawa as prime minister of the Dominion.

He was barely thirty years old when he entered the political arena, having been elected to represent his own district in the Quebec Legislature. It was no discouragement to him to act as a member of the minority party, he being content to bide his time till that party should win supremacy. He made a speech, in reply to the address from the throne, that marked him as a parliamentary orator of fine powers, and at once put him in the front rank of political debaters. Louis Honoré Fréchette, the poet, who heard him, describes the effect of his "fluent, cultivated, and charming discourse" as magical and full of wit. There was power in his personality, magnetism in his very presence. Attractive in appearance, eloquent in French and English, cultured in language and attainment, he is a man of whose personality his fellow-citizens have every reason to be proud.

He entered the Dominion Parliament in 1874, the year in which Sir John MacDonald, so long predominant, was driven from power, to the dismay of his Conservative supporters. It was the political revolution which followed this Conservative collapse that carried young Laurier into the Dominion Parliament, as a representative of the Liberal party. Two years later he was in the Mackenzie cabinet. After the fall of this administration, in 1878, he remained in parliament, and was returned by his constituents at each succeeding election, by ever-increasing majorities. In 1889, when Mr. Blake, the Liberal leader, was compelled to yield this position, Mr. Laurier was asked to succeed him. He hesitated. The French-speaking minority in the Dominion had never before been requested to provide a national leader for either of the two great political parties, and many of the Liberals feared that the experiment would not prove successful. But the demand was so spontaneous and urgent, that he was at length prevailed upon to accept the chief-ship of his party, in which his success was marked and brilliant.

Often a Few Words Ejaculated in the Earnestness of Feeling Make a Man Famous.

As leader of the Liberal party he met and surmounted great difficulties, and caused the people of the Dominion to prefer a statesman of French-speaking origin—a Catholic—for the highest post in the government, solely on his merits as a man.

His most noteworthy speech is thought to have been that in which he brought home to the government the accusation that the rebellion of the half-breeds in the Northwest in 1885 was due to its mismanagement. A personal admirer, who was in the House of Commons at the time, says: "Parliament will never forget Laurier's exclamation—'Too late . . . ! Too late . . . ! Too late . . . !'—which he thrice used. It was a solemn moment.

"Each of the orator's pauses seemed to be an age. A silence of death brooded over the house, broken only by the terrible monosyllables which summed up the drama of the insurrection, and each of which must have gone straight to the hearts of those responsible. 'If criminals are wanted,' he exclaimed, pointing to the ministers, 'do not seek them among the dead on the battlefield or the scaffold,—they are here before us.'"

Many of the legislative measures taken by Canada in recent years, were initiated or supported by Laurier. When the United States declined to negotiate a broad and comprehensive reciprocity treaty with Canada, the preferential tariff for products of Great Britain was established by his government. For this new departure in imperial policy, "with the marvelous goal to which it leads," the London *Times* declared, "Laurier's name must live in the annals of the British Empire." Another great achievement of Sir Wilfrid was the settlement of the Manitoba school question by conciliation, instead of coercion, through the removal of the disturbing question from the turbulent arena of Dominion politics to the legislature of the province, which is charged with the management of its schools.

The greatest recent fight against Sir Wilfrid and his government was made on the charges of fraud by the Klondike officials, led by Charles Hibbert Tupper, a legislative fighter of great tenacity. The question of sending soldiers to South Africa was another difficulty for the Liberals, which was tossed so energetically back and forth that the regiments hardly knew to which party their final sending was due.

In 1900 the parliament was dissolved and a new election ordered, the nominations being made October 31, and the election taking place November 7; a single week being left for all the business of campaigning. The Conservatives were strongly hopeful of a return to power, but when the election was over and the votes were counted the opinion of the people was shown in a form which they found the reverse of comfortable.

A Man of Progressive Ideas is the Man to Lead in the Twentieth Century.

The party simply went to pieces. Scores of leading statesmen of the past failed to be returned, among them Sir Charles Tupper, for forty years one of the foremost figures in Canadian politics, who never before had felt the bitterness of defeat. In Manitoba the son of Sir John Macdonald, and premier of the province, found himself similarly left out in the cold. As for Sir Wilfrid himself, he was returned to power by a majority of almost two to one.

The great beauty of this overthrow on the one hand and triumph on the other was, that it was all done in a week. There were no long months of anxiety and political scheming. And it certainly seems to prove that the present Liberal government is looked upon by the people as a good thing for the governed.

There can be no doubt of Sir Wilfrid's popularity. What is the mainspring of it all? Certainly, much of it can be traced to his personal magnetism, his kindly, considerate disposition, his conciliatory nature. He has shown himself throughout a man of lofty and progressive ideas, and the Dominion, one would say, could not well be better placed than under his control.

Pole Star Pointers

Punctuality is the mother of confidence. Be on time. Be frank. Say what you mean. Do what you say. So shall your friends know and take it for granted, that you mean to do what is just and right.
John Griggs.

Be honest, be temperate and never gamble. *John Jacob Astor.*

Cut short your losses, and let your profits go on. *Recardo's Rules.*

He that has never known adversity, is but half acquainted with others, or with himself, for constant success shows us but one side of the world. *Colton.*

Take a bargain at once. Be an off-hand man. Be cautious and bold.
Rothchild's Business Rule.

Until men have learned industry, economy and self-control, they cannot be safely intrusted with wealth. *John Griggs.*

When I caution you against becoming a miser, I do not therefore advise you to become a prodigal or a spendthrift. *Horace.*

The way to gain a good reputation, is to endeavor to be what you desire to appear.
Socrates.

You may depend upon it, that he is a good man, whose intimate freinds are all good. *Lavater.*

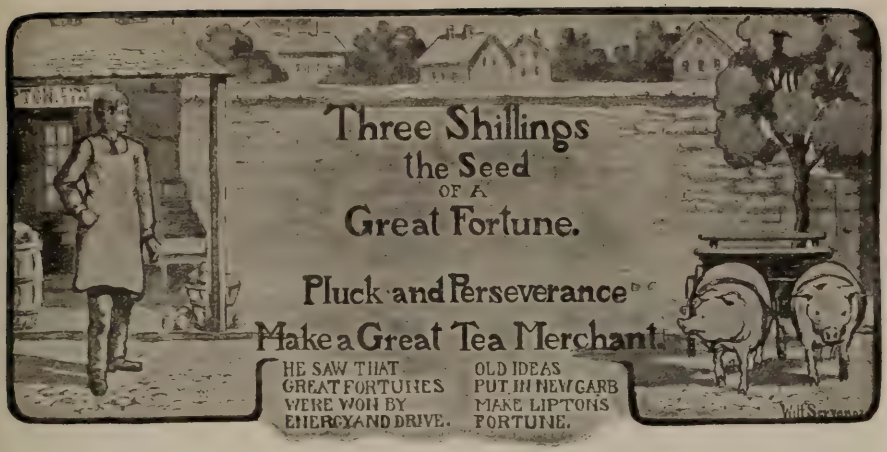
Actions, looks, words, steps, form the alphabet by which you may spell "character." *Lavater.*

The best rules to form a young man are to talk little, to hear much, to reflect alone what has passed in company, to distrust one's own opinions, and value others' that deserve it. *Sir William Temple.*

Deliberate with caution, but act with decision, and yield with graciousness, or oppose with firmness. *Colton.*

This above all—to thine own self be true,
And it must follow, as the day, the night,
Thou canst not then be false to any man.
Shakespeare.

Many men do not allow their principles to take root, but pull them up, every now and then, as children do flowers they have planted to see if they are growing.
Longfellow.


Three Shillings
the Seed
OF A
Great Fortune.
Pluck and Perseverance
Make a Great Tea Merchant
HE SAW THAT GREAT FORTUNES WERE WON BY ENERGY AND DRIVE.
OLD IDEAS PUT IN NEW GARB MAKE LIPTONS FORTUNE.

If there is a man who won't be beaten now living it is Sir Thomas Lipton, in whom we have a notable example of British pluck and perseverance, those qualities which have led to so many triumphs. Year after year he has sought to win the international yacht cup from America, and after each defeat has gone back with a smile on his lip and a resolution in his heart to "try it again." The story of his career is well worth giving.

About the time the Civil War in the United States began a ragged little Scotch boy, twelve years old, landed in New York from the steerage of a steamer. He had crossed the ocean as a stowaway, bent on reaching the New World by hook or crook. In his pocket were three shillings, his entire fortune, yet he rattled them bravely as he walked up Broadway looking right and left for a chance to work. If the youthful immigrant had little cash in his pocket, he had a fortune in his heart and brain. Wherever he went he used his eyes and his mind. The hustling new country to which he had come was a revelation to him. It was a very different place from the slow-going old country which he had left. The few years he spent in America were years full of useful lessons. Two ideas came to him.

New Fortunes to be Made by Energy and Drive

He saw that great fortunes in the New World were won by energy and drive, by bold advertising and steady keeping in the front of affairs. One of his ideas was that new fortunes could be made in the same way. The other was that the country he had come from was the best place to put these methods into effect. There a virgin field awaited him, where the first man who applied American push to the wheels of trade was sure of success.

Back to Scotland went the boy, with little more money than he had brought with him. But he had his new ideas of the way business should be done, and they were worth more than a full purse of greenbacks. A few words will show what they were worth to him. To-day Thomas Lipton's fortune is estimated at fifty million dollars. He is a contractor for the British army and navy; he has a magnificent plantation on the island of Ceylon; he has a pork packing establishment in Chicago; he makes ginger ale in Dublin; he owns warehouses in Calcutta and Colombo; he sells tea in New York; he manufactures candy in London; he sails the fastest yachts in British waters; he has been honored by his admiring countrymen with the title of "Sir" Little

"Tommy" Lipton is to-day the highly respected Sir Thomas Lipton.

Going Into a New Business in a New Way. Lipton Adopts Novel Methods of Advertising.

When the young wanderer got back to his home in Glasgow, he went to his father, who was a poor workman in that city. He told him what he had learned in America and that he wanted to start in business. After a good deal of persuasion, his father gave him all his savings, about four hundred dollars. With this money, Thomas opened a little provision store, in which he made a specialty of selling teas. He spent the greater part of his little capital in advertising. That was his idea of securing customers. His father gave him two of his finest hogs, which he cleaned, and scrubbed, and polished, until they presented a showy appearance. Then he harnessed them to a small red wagon, on which were painted the words, "Go to Lipton's". The Scotch people were amazed at the odd conveyance with its queer steads, and followed it along the streets until it stopped at Lipton's store, which was painted in as fiery colors as the wagon. The store was a success; it became a great success; new stores followed it, until now the aspiring grocer and tea merchant controls five hundred and twenty flourishing stores, aside from his other lines of business.

"Honest Application is the Science of Achievement."

Sir Thomas Lipton tells very happily in few words the secret of his success. "It was my admiration for American methods that gave me my start," he says. "If I were a poor man to-day I would be as happy as I am now; I know I could start fresh and win again. Honest application is the science of achievement. Whenever you find an opportunity to do something that will benefit you, do not fail to take advantage of it. Often, the most trying periods will produce the best results. I will give you an instance. Fifteen years ago, while sailing down the African coast in a steamer which carried, as the bulk of its cargo, my teas, we were assailed by a terrific storm. The steamer had to be lightened. At one time it looked very much as if we were going to be wrecked; but, really, I thought more of the loss of that tea than of anything else. I had it brought on deck, with the idea of using it, if it had to go overboard, for advertising purposes. On each case I had painted, in large black letters, 'Lipton's Tea,' and then cast it overboard, hoping that it would float to the African coast, and be picked up by someone who had never heard of Lipton and his tea. And sure enough it was, and orders came from it."

It Pays to Advertise One's Wares and to Employ Novel Methods.

Another example of Sir Thomas' idea of the value of advertising was shown at a later time in the harbor of Sydney, New South Wales. A series of murders had taken place in its mining districts, and the murderer escaped to San Francisco, where he was captured. He was taken back to Australia, and the arrival of the steamer was awaited with much interest. On the morning it was due, hundreds of sailing and steaming craft went outside the harbor to escort it to an anchorage. In this vast flotilla were scores of small yawls, and on the sail of each was seen "Lipton's T," in striking black letters.

A man with such enterprise as this could not fail in the difficult art of winning. We have only to name the Lipton methods to understand how Sir Thomas earned his millions and spread his business enterprises to all quarters of the globe. That is not to say that every man could have the same success as he with the same methods. Each new enterprise helps to fill some channel, and new channels must be opened for new great successes. But there are new ones always waiting for men of enterprise.

"I have often been asked to define the true secret of success," says Sir Thomas. "It is thrift in all its phases, and, principally, thrift as applied to saving. A young man may have many friends, but he will find

none so steadfast, so constant, so ready to respond to his wants, so capable of pushing him ahead, as a little leather-covered book, with the name of a bank on its cover. Saving is the first great principle of all success. It creates independence, it gives a young man standing, it fills him with vigor, it stimulates him with the proper energy; in fact, it brings to him the best part of any success,—happiness and contentment. If it were possible to inject the quality of saving into every boy, we would have a great many more real men.

A Good Definition of Knowledge Includes Book Learning and Observation.

"Success depends also on character to carry it through life. Knowledge should be a compound of what we derive from books, and what we extract, by our own observation, from the living world around us. Both of these are necessary to the well-informed man; and, of the two, the last is, by far, the most useful for the practical purposes of life. The man who can combine the teachings of books with strong and close observation of life, deserves the name of a well-informed man, and presents a model worthy of imitation."

We may say, in closing, that there is one thing in which Sir Thomas has failed. After beating Europe, he tried to beat America and found it the hardest task of his life. His great passion is for yachting, and he made up his mind to take back to England the famous cup which the yacht *America* took from England fifty years ago. He has spent more than half a million dollars in building and racing the *Shamrock I.* and the *Shamrock II.*, and the cup is still on American soil. Yet he came nearer to winning the prize than any man before him, and no one can say but that he will yet win. He has brought victory down to a question of seconds, instead of minutes. He maintains the belief that the best record is still to be made and his boat will make it. What he has won has been the respect and admiration of Americans for the good humor and manly sense with which he has accepted defeat. And if he yet takes the cup it will come to him full of American good will.

A Hero in Homespun.

The boy who succeeds wins his laurels because he ignores the distracting things in his path, and concentrates all his energies and abilities upon one thing. Every boy has enough in him to do wonderful things, if he can keep to one purpose.

"Try to come home somebody," said Leon Gambetta's mother, when she kissed him good-by. The little hero in homespun garments was going to Paris, with his mother's small savings and a great determination. He was to be a lawyer; that hope was his constant companion, it was his bedfellow. His poorly furnished garret was only an incident; it did not change his singleness of aim. Other attractions called to him, but above all the voices there was one which commanded, "Be a lawyer." He heeded only it. Then came a day when his determinate purpose was to be rewarded. Jules Favre was to make a speech, but when the evening arrived sickness prevented, and he asked young Gambetta. Gambetta's time had come. A sentence in his speech took the people. "The will of the people can never change might into right." It marked him as a leader. The story illustrates what bunching all the energies and time and talents together, and making them work out one plan, persistently, will accomplish.

At some time in every boy's life a beautiful vision comes of what is possible to him—a temple high upon a hill; and voices seem to call him to try to reach the temple. So he begins. The road to anything high is rough; sometimes the prize seems too high; deviating paths open, the climber tries these side paths often. To-day the boy would study law, it grows tiresome; to-morrow medicine is the prize, it taxes the strength too much; then electrical engineering. So the rough road to distinction is left. There is a little flower which always lifts its leaves to the clouds; if rains and snows lay it low, it is only for a time; relieved of its weight, it points upward again. There is a determination like that. *Boys who win are boys who set their hopes high, and hold on.*

"It is a matter of time and work, I shall get it yet; all I need to do is to keep trying."—*Marconi.*

HARD WORK AND EXPERIMENT MAKE MARCONI AND HIS WIRELESS TELEGRAPH

For more than half a century men did their telegraphing by the aid of wires. It remained for a young Italian boy to teach them how it could be done without wires, how viewless cables could be stretched through the air, or through the ether which pervades earth and air alike. Marconi was the name of this boy; William Marconi, if we anglicize his name. In fact, he was half English, or Irish, for while his father was an Italian, his mother was the daughter of a wealthy Dublin manufacturer, who had gone to Italy to study music, and there met the paternal Marconi, a wealthy and dashing Italian, who won the love of the Dublin girl.

Latent Genius Should be Encouraged by Means to Experiment

The youthful Marconi was half dreamer and half worker. He did not end with thinking, but hastened to put his fancies into practical shape. It was to this that he owed his success. He began the work of invention early. At the age of twelve he put together a contrivance which so attracted his tutor that the latter wanted to exploit the invention for his own profit. But the boy refused to let anyone else have a share in his work. His parents were rich enough to let him go on much as he pleased, though they often remonstrated against his strange ideas and the ways he wanted to carry them out. By the time he was sixteen, young Marconi had modeled various instruments, in which were evidence of his latent genius. They showed an insight into mechanical problems far beyond his years, and were of sufficient promise to win the praise of his friends.

New Ideas Give Rise to Many Questions Hard to Answer.

When Marconi was twenty years old his talent for invention was first turned towards wireless telegraphy. This is what turned it in that direction. A German, named Heinrich Hertz, had, not many years before, made a great discovery in the science of electricity. By using currents of great power he produced electric, or electro-magnetic, waves in the ether, which were capable of passing for a considerable distance without a conductor. Like the waves of light, the ether itself served them for conductor. Hertz detected their presence by the aid of a broken wire-hoop. The waves which reached the hoop by induction sparked across the broken space.

This discovery meant far more than Hertz imagined, or than any of the other scientists who reproduced his experiment dreamed. It made possible the art of telegraphing without wires, though Marconi seems to have been the first to perceive this. It was in 1894, when Marconi was just past his twentieth year, that he first read Hertz's work. A new idea flashed into his mind. Hertz had seen a spark in a broken hoop, a few feet away from the flash of an induction coil. Why didn't he get a better detector than a broken hoop, and a better transmitter than a small induction coil, and send out the flashes in such a manner that the detector would record a message? Hertz might have done so if he had lived, but he died about this time, and the practical significance of his discovery was left for the young Italian to perceive. Why did not Lord Kelvin, or Professor Lodge, or any other of the great electricians perceive this, and think of what the great discovery really involved to practical science? Marconi, himself, when the thought occurred to him, believed that the idea must have come or soon would come to one of these scientists, He was not an electrician himself. It seemed presumptuous for him to try.

"By going on until I determine the limits of pratical operation, I know absolutely what is right and what is wrong and I never have to go over the same ground twice."—*Marconi.*

Don't Waste Time on What Others Have Already Done.

"Someone else," he reasoned, "will have thought of this. There is no use in my wasting time working on it."

He waited almost a year, still turning the matter over in his mind, still watching for the announcement of a system of wireless telegraphy by Hertzian waves,—but none came. He grew impatient. This was in December, 1894.

It must not be imagined that Marconi was the first to think of wireless telegraphy, or to endeavor to invent a workable system. The idea had been long in the air, and the first steps toward it had been taken many years before. Faraday had long ago investigated and developed the principle of electric induction—through which a current passing in one wire causes a current to appear in another wire near by but separated from it. Others after him had worked on and perfected the induction coil. Hertz used one of great power. There was little more to be done. The thing to be done was to discover a more sensitive means of detecting the electric wave. As long ago as 1866 Professor Varley noticed that metal filings lying loosely together had considerable resistance-effect in the presence of an electric current, and Guitard is said to have noticed the cohesion-effect of an electric current on dusty particles in the surrounding air. About 1884, an Italian, Professor Calzecchi-Onesti, made some experiments with copper filings between two brass plates, and found that these filings could be made conductors if influenced by electric disturbance set up by an induction coil. Five years later Proressor Branley improved the Italian's apparatus and found that loose filings affected by an induction coil continued to be affected until they were restored to their normal condition by shaking or tapping the tube which held them. This enabled him to make or break a circuit at will. The filings cohered together until shaken apart.

"Here," said Marconi to himsef, "is my electric eye. If I arrange an electric circuit complete, except for a gap of metal filings, a local circuit can act only when the filings are being affected by the Hertzian waves produced by the induction coil."

"It is a Matter of Time and Work, all I Need is to Keep on Trying."

Such was the suggestion upon which the youthful Italian inventor began to work First of all he must perfect the "coherer," that is, the tube containing the fine filings. Whoever may think this was an easy thing to do, should be condemned to try it for himself. It was difficult enough to try the patience of the inventor to the utmost. He tried hundreds of different coherers before he got one that did its work to his satisfaction.

"It is a matter of time and work," he said in his own mind. "I shall get it yet; all I need to do is to keep trying."

A friend asked him how he could remain so cheerful, after he had worked for several days with continued failure. The youthful inventor replied:

"I am as well satisfied when I fail to get the signals with a certain arrangement as when I succeed, because it shows me that an arrangement which fails will not work and that I must try another. By going on until I determine the limits of practical operation, I know absolutely what is right and what is wrong, and I never have to go over the same ground twice."

He got it at last. He was able to send and receive a wireless message across a room, and knew that he was on the high road to success. But his great discovery came when, in seeking to send a message to a receiver a mile away, he found he was affecting another receiver at the same distance though a hill nearly a mile long lay between. This taught him that the waves passed out in all directions from the sending instrument and could be picked up by receivers in a circle all around it. All that was needed was a sufficiently powerful source of the electric waves and a sufficiently sensitive receiver to extend his one mile to many miles. Those many miles have been covered. To send a wireless message through a hundred miles of air is now an easy achievement. Marconi has gone far beyond that, and sent them over two thousand miles of sea, while he has even sent a signal across the Atlantic.

Two Hemispheres are Linked Together By a Young Man of Patience, Perseverance and Hard Wark.

But it is not the fact that one may yet be able to send a message across the Atlantic for

Marconi's Car equipped with apparatus for wireless telegraphy.

a cent a word, more or less, with which we are here concerned. Our interest is in the young man who, by patience, perseverance, hard work, and a spirit which could not be defeated, has linked the hemispheres together without any visible connecting medium. It would have made no difference to Marconi if he had been born of poor instead of wealthy parents. His success would have been merely somewhat longer in coming

ENGLAND
NEWFOUNDLAND
"IT IS A MATTER OF TIME AND WORK; I SHALL GET IT YET: ALL I NEED TO DO IS TO KEEP ON TRYING."
SIGNOR GUGLIELMO MARCONI

THE MARVEL OF THE 20TH CENTURY

Wireless telegraphy is one of the triumphs of the New Century. It has harnessed the electricity of the earth and sky for its uses. It promises to be of great value and may replace the cable and wire in carrying messages. Patient and painstaking experiment has at last brought to William Marconi fame and honor and made his name a household word to be associated with those of Franklin, Morse and Field, his predecessors in this work.

Whatever effect environment may have on the shaping of character, one cannot know Marconi without feeling that he is the possessor of a master mind.

He understands overcoming obstacles. Failure never daunts him. He does not regard himself as a man of destiny. He does not want any honor which belongs to others. Indeed, he is slow to accept the praise which has been so heartily given him. Few know him as a linguist, but he speaks and writes several languages, Few know him as a musician, yet he plays several instruments admirably, having studied under a master. As a general good fellow, there are few more companionable.

"Anyone else," he says, "might have done what I have done, if he had worked as hard and tried the same means."

True enough, but hard work and the ability to profit by experience are the two factors of success which distinguish men of his calibre. Marconi has never had any other working creed than that. He has worked hard, and has profited alike by his own experience and that of the investigators who have gone before him.

"Everything", he says, "depends upon the capacity to follow an idea to a solution, to adapt it to fresh facts, and to discover new results. The inventor must be quick to grasp and note the advantageous features and work so that he may turn those features to account in carrying out his original purpose. I have all respect for the past, and great admiration for what has been done, but I have no sympathy for the men who stick to old methods and old ideas when improved means have been developed. Physical science may have begun in the witch's kitchen, but we have not allowed it to stay there."

Good Advice from Contemporaries.

Max O'Rell, the distinguished French humorist, says:

"You will not find one Frenchman out of a thousand who tries to become wealthy. His aim is to become well off. When life is secured by good, safe investments he knocks off and gives somebody else a chance."

"What we need in our family life is cheerfulness."

"One thing you may be sure of, and that is, no man can possess ten millions—the ten millions possess him."

"Life consists in cheerfulness and happiness close at hand. The deepest of all human longings is simply to be wanted. It is better to be loved than to love, and the greatest happiness is to know that someone is glad you are alive.

"The hours of our lives are numbered by the sounds of coming feet. If you doubt it, wait until the feet have ceased to sound along the street or by the door."

John Field, the great merchant, says:

"If anyone were to ask me, 'What shall I do in starting life?' my reply to you would be, 'Commence at once to build character. Plant yourself squarely, as a platform in life upon the Decalogue. Be true to yourself, honest from centre to circumference, and success will eventually crown your life."

Lemuel E. Quigg, the Congressman from New York, says:

"Opportunity is ever present, and often in forms that are little promising. An accidental meeting, a chance remark, a playful jest, a malicious taunt, a paragraph in the newspapers—in such trivialities as these is opportunity often to be found."

"All achievement involves a contest. If what we are after is really worth while, we can be very sure that somebody else is after it, too."

"We live in a practical world. It concerns itself with the present. It will not look far ahead nor far behind. It is suspicious of prophecy, it is impatient of retrospect. It likes the sort of man that can turn to and do things while it waits. It has no use for the man that can never get a result."

"Even in our own times it will not do to get too far away from the age, or to ignore its problems, its interests, its hopes and its ambitions."

"There is no sound that catches the public ear so quickly as the note of insincerity. There is no manner that strikes the eye so surely or so offensively as the pretense of good fellowship."

DON'T WAIT FOR A CHANCE

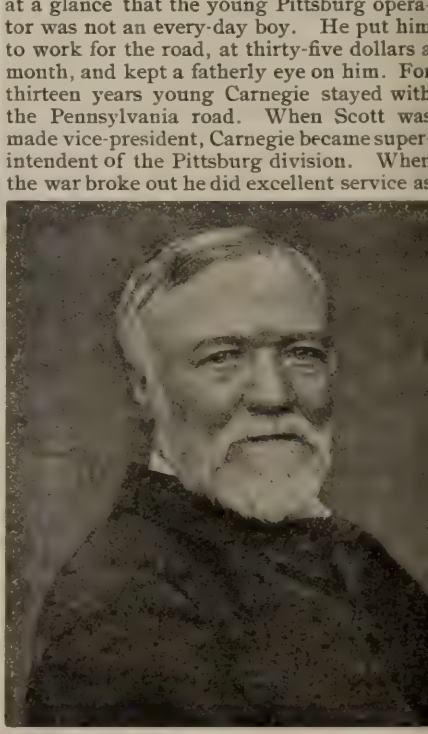
THE PITTSBURGH BOBBINBOY BECOMES THE CROESUS OF THE MODERN WORLD.

Don't wait for a chance; make your chance. This is one of the mottoes of success. Everybody knows the man whom we are going to offer as an example of this. It is likely that the name of Andrew Carnegie is known to men who never heard even of King Edward of England. It has spanned the world, and is a household word in far off nations. For the career of this man has been almost as magical as that of Aladdin, of the wonderful lamp.

It is hard to imagine that this modern Crœsus began work, a little more than fifty years ago, as a bobbin-boy in a cotton-mill at Alleghany, Pennsylvania, for a dollar and twenty cents a week. He was then only eleven years old. He was the son of a poor Scotch weaver who had just come to the New World. When the boy was thirteen, he was given charge of an engine in a bobbin-factory. A year later he became a messenger in the Ohio Telegraph Company's office. Here he showed some of the qualities of Edison. He soon taught himself to be an operator, and to read messages by sound—which few then did. This brought his wages up to six dollars a week, and the boy felt rich; especially as he could support his mother, who was now a widow, and his little brother.

Not an Every-day Boy.

This is the work he was at when the Pennsylvania Railroad was brought into Pittsburg. Colonel Thomas A. Scott, the greatest railroad manager of that time, saw at a glance that the young Pittsburg operator was not an every-day boy. He put him to work for the road, at thirty-five dollars a month, and kept a fatherly eye on him. For thirteen years young Carnegie stayed with the Pennsylvania road. When Scott was made vice-president, Carnegie became superintendent of the Pittsburg division. When the war broke out he did excellent service as



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"I believe in developing a dignified and unselfish life."
—*Andrew Carnegie*

Superintendent of military roads and telegraph lines. He was then twenty-four years of age.

While the young man was thus working with all his strength and will, he was shrewdly laying the foundations of his great fortune. At Colonel Scott's suggestion he bought ten shares of the Adams Express Company, he and his mother mortgaging their little home to raise the five hundred dollars needed. At a later date he again dorrowed money to buy an interest in the Woodruf Sleeping-car, then just invented. In 1860, he joined Colonel Scott and another man of speculative tendency, to buy the "Story farm" on Oil Creek. For this forty thousand dollars were paid. It proved an oil bonanza, and netted its owners five million dollars. The bobbin-boy of twelve years before had become a wealthy man.

Carnegie now began to display the extraordinary business daring and ability which were to make him famous. His first big deal was the Keystone Bridge Company, organized by him. Iron bridges were then taking the place of wooden ones, and he was shrewd enough to take hold of this line of business at its start. But steel—of the cheap Bessemer kind—was tougher than iron. He began to put this into his bridges, and soon every bridge-builder wanted them. Bridges did not satisfy his ambition. Iron and steel have a multitude of uses. Carnegie branched out in new directions, and with such keen business judgment that his enterprises never failed. Whatever he touched seemed to turn to gold.

"Put Your Eggs All in One Basket But Watch That Basket"

It is too long a story to tell all he did. It must suffice to say that his business grew rapidly larger and his enterprises became more daring, until by 1888 he had added to his bridge work the Edgar Thompson and the Homestead Steel works, the Duquesne Steel works and furnaces, the Lucy furnaces, and the Upper Union and Lower Union rolling-mills. This was an immense business to be under the control of one man, capitalized, as these concerns were, at $100,000,000, and including a great area of coal and iron lands. In 1901 they were turned over to the United States Steel Corporation, at a value of between two and three hundred million dollars in cash, mortgage bonds, and stock. Carnegie was a millionaire some two hundred and fifty times over, and felt that he could safely retire from business. We may say here that one of the great things he did was to discover the manufacturing genius of Charles M. Schwab, whose story is so interesting, and to whose ability Carnegie owed half his success.

He Founds Libraries and Endows Universities.

Andrew Carnegie's later life was in its way as remarkable as his earlier one. Under his theory that a man should be ashamed to die rich, he had long been spending money freely in the founding of libraries and other institutions for the education of the people. He was fond of books. He is himself the author of a number—and very telling ones they are. He thought it better for mankind to put ideas in their minds than money in their pockets, and it seemed to him that the creation of libraries was an excellent means to this end. But libraries were not all; Pittsburg was benefited by him with a number of useful and richly endowed educational and other institutions.

After his withdrawal from business Carnegie's gifts became stupendous in amount. In addition to a multitude of smaller gifts, he gave New York City the great sum of $5,200,000 for branch libraries, and the Universities of Scotland $10,000,000 for the tuition of poor students. This was followed by a second $10,000,000 for the founding in Washington of a "Carnegie Institution," its purpose being the promotion of the higher learning and the aid of scholars and scientists in valuable work of original research.

This seems immense, but it is not so when one considers the lake of wealth from which the river of good works flows. Mr. Carnegie has, as yet, confined himself mainly to giving away his income, with but little incursions into his capital. What vats schemes of future giving may be fructifying in his mind no one but himself knows. But

if he lives up to his motto that a man should be ashamed to die rich, the world will certainly be the better off that Andrew Carnegie gathered together one of the greatest single fortunes ever held by man.

Andrew Carnegie Gives a Business Man's Advice to Young Men.

"Do not make riches but usefulness your first aim, and let your chief pride be that your daily occupation is in the line of progress and development; that your work, in whatever capacity it may be, is useful work, honestly conducted, and as such ennobles your life."

"If you ever enter business for yourselves, never endorse for others, because it is dishonest. All your resources and all your credit are the sacred property of men who have trusted you, and until you have surplus cash and owe no man, it is dishonest to give your name as endorser to others."

"Whatever your salary be, save a little; live within your means. The man who saves a little from his income has given the surest indication of the very qualities that every employer is seeking for."

"You will never make much of a success if you do not learn the needs and opportunities of your branch much better than your employer can possibly do. You have been told, 'obey orders if you break owners.' Do no such foolish thing. If your employer starts upon a course which you think will prove injurious, tell him so and protest; give your reasons, and stand by them, unless convinced you are wrong."

"The great successes of life are made by concentration. Do not think you have done your full duty when you have performed the work assigned you. You will never rise if you only do this."

"Put all your eggs in one basket and then watch that basket. Do not scatter your shot."

"Having entered upon work, continue in that work; fight it out on that line, except in extreme cases, for it matters little what avenue a young man finds first, success can be attained in any branch of human labor. There is always room at the top in every pursuit."

"Believe me, there is no true happiness in life, nor proper self-respect, without the performance of useful duties, without earnest labor in some useful department of human endeavor. I trust that everyone of you will have to work, and work hard and long for your living."

"The 'Almighty Dollar' bequeathed to the young is generally an almighty curse; it deadens their energies, destroys their ambition, tempts them to destruction, and renders it almost impossible that they should lead lives creditable to themselves or valuable to the State."

"Every man and woman is responsible for the performance of the pressing duties of his day and generation. The past ages are not ours, and we know not the future; our duty is to equip ourselves for the demands of our own age."

"All things are improving in this age. It is the best age for a man to live in that ever existed. Wrongs are so quickly exposed; changes are so rapidly effected; the world is moving forward at such a rapid pace that we may all congratulate ourselves that we live in a period of activity hitherto unequalled."

"I have no hesitation in stating that any young man or young woman fortunate enough to have to make his or her own way in the world, chooses wisely by making an early start."

"The only way to attach to any institution the most capable young men is to prove to them that in its service merit is the only test, and certain to meet with recognition and promotion."

"We hear much of civil service in the various branches of the government, but it is far more important that a strict system of civil service maintained in all branches of labor; in the bank, factory, mill, school, college, university, deserved promotion should be the strict rule."

"The question of 'The Rich and Poor' is almost solved when the rich act only as trustees of the poor in the distribution of their wealth."

"Surplus wealth is but a trust, which every man is bound to administer during his life, for the good of the people from which that wealth came."

BOOK V.

BOOK OF ETIQUETTE

THE LATEST AND MOST SENSIBLE STATEMENT OF THE RULES GOVERNING SOCIAL INTERCOURSE—THE ETIQUETTE OF CONVERSATION, OF PARTIES, OF VISITING, OF RECEIVING, OF WEDDINGS, OF FUNERALS, OF ALL PRIVATE AND PUBLIC OCCASIONS, AND OF LETTER-WRITING OF ALL KINDS.

WHAT TO DO, WHAT TO WEAR, WHAT TO SAY, WHAT TO WRITE

BOOK OF ETIQUETTE

WHAT TO DO—WHAT TO WEAR—WHAT TO SAY—WHAT TO WRITE—
THE CORRECT THING AT HOME—AT PARTIES—AT WEDDINGS
—AT ALL PUBLIC AND PRIVATE FUNCTIONS

GENERAL PRINCIPLES OF GOOD MANNERS

Good manners stand next to a good heart in adapting men and women to the community in which they live. Indeed, so far as the opinion of ordinary society rules, they go further, for however gifted by nature or education one may be, or however well-intentioned and virtuous in conduct, if he is ignorant of the customs and requirements of good society, is awkward or ungraceful in manner, careless in speech, and heedless of social demands, and even of the arbitrary dictates of fashion, he risks exposing himself to ridicule, and may be neglected or contemned, while men far below him in character and ability, but with superior knowledge of correct social deportment, may become the admired favorites of the world. In short, it may be said that success in life often depends far more on appearance and deportment than on innate character.

According to Swift, good manners are the art of making those people with whom we converse feel at ease. This is doubtless true so far as conversation is concerned. Persons of generous impulses naturally seek to render themselves agreeable to those into whose company they come, and are no more eager to gain enjoyment for themselves than to bestow pleasure upon others. The art of pleasing is, in truth, a simple one, but frequently its cultivation is too much neglected. Many persons become so solicitous for the promotion of their own pleasure as to forget that their neighbors have claims upon them. Yet every man who enters society should bear in mind that, in a sense, he ceases to be an individual, and becomes part of an association, a social organism, as it has been called; met together, not for any one's personal gratification, but for the pleasure of the whole company.

The first requisite in our intercourse with the world, and the chief in giving pleasure to our associates, is sincerity of heart, a quality which lends the same ornament to character which modesty does to manners. A second important element of social behavior is lack of self-assertion, a modesty of manner, native or acquired, which is in no sense inconsistent with firmness and dignity of character. The well-bred man feels at ease in all companies, is modest without appearing bashful, and self-possessed without an undue forwardness of manner.

The Art of Conversation.

To one who would make his way in the society of intelligent people, a well-selected fund of information and anecdote is a highly important prerequisite. An enlightened understanding and a store of interesting knowledge are essential to him who would shine in conversation. None can hope to make small talk go far with people of culture, and all who wish to win credit in social circles will need something deeper and more enduring than chat on passing trifles and local events.

The faculty of communicating thought is, in a great measure, peculiar to man, and the pleasure which he derives from the interchange of ideas is one of his leading elements of enjoyment. There is nothing more agreeable to most persons than pleasant, sprightly, fluent conversation, spiced with anecdote, and seasoned with the results of good reading, and we are all happily constituted to take delight in the mutual interchange of thoughts.

The best rule of conversation undoubtedly is, to "adapt yourself to your company." Thus commercial men enjoy conversation on subjects having some relation to affairs of business; men of pleasure, whose thoughts are given only to entertainment, prefer light talk on pastimes or social events; and professional men love to dwell on new books, the discoveries of scientists, the latest doings in the arts, and similar learned subjects.

Attention to these suggestions will be of use in helping men of learning and men of pleasure alike to derive mutual advantage from their different qualifications, and we need but say further that those who wish to please should be well informed on subjects of most general interest, whether this interest be of temporary or permanent character. An accurate and extensive knowledge on learned subjects is far from being sufficient for conversational needs, and may lead to prosy and wearisome talk in the opinion of less erudite people; one must also have a ready knowledge of the common occurrences of life, and of important events which are arising day after day, must know something of the fine art of chatting, and how to spice heavy subjects with anecdote and illustration. The art of conversation is a difficult one to acquire, and fine conversers must be born with a native faculty in that direction.

Avoid Heated Argument.

Speech is so vital an element of social intercourse that too much attention cannot be given to its requisites, or too much study to its cultivation.

In conversation it is of high importance to avoid heated argument. Difference of opinion is likely to arise very frequently, but one should always express his views calmly and gently, and avoid all eager or loud assertion. It is not so important that you should force your auditors to accept your special views. If your antagonist begins to grow warm, you should at once put an end to the argument by a quiet turning of the conversation. Disputes severely try the temper of many men, and are likely to end in the mortification of one disputant, generally with no advantage to the victor. They should, therefore, be avoided.

Yet no one is called upon, for the sake of avoiding argument, to give a general assent to all that is said in company. Assent without conviction indicates a mean and subservient spirit, and may tend to confirm others in wrong opinions. Yet it is wise to oppose calmly and correct with gentleness, and, while showing that you have a mind of your own, to show that you respect the opinions of your companions.

Consider the Feelings of Others.

Do not speak in a loud voice or assume a dictatorial tone, and if a statement is made which you know to be incorrect, be careful of the manner in which you correct the speaker. Suggest a correction, rather than make it; and if the matter is unimportant it is far better to let it pass unnoticed. There is nothing more unwise than to insist on trifles. Those who go abroad to correct the world's mistakes are apt to find themselves very frequently in hot water. If addressed in an offensive tone, it is the part of wisdom not to notice it; an intention even to insult or annoy can safely be passed over for the time being. One should consider the feelings of the other persons present, and not annoy them with personal affairs of a disagreeable character, nor permit others to force him into a quarrel in company. There is, of course, a limit of insult which a self-respecting man can not let pass; but to bear and forbear is the part of good manners. Quarrels can be left to bide their time, and there is no better way of repelling an inuendo than by ignoring it or treating it as unworthy of notice. Such a thing as a "scene" in society is, above all things, to be avoided.. It is the insulter who loses social caste, not the insulted.

HOME LIFE IN OLDEN TIMES

A glance will suggest the interest of life in colonial times and at the beginning of the 20th century.

Care in the Use of Witticisms.

If you have wit, or fancy you have, which is oftener the case, it is well to use it with caution and judgment, and particularly to avoid seeking butts for your wit among your associates. Wit is a quality which all admire, yet which most fear, and which no one enjoys being made the victim of. If used in a satirical manner it is often malignant in character, and any man possessed of this cutting weapon may find much better occasions for its use than against the self-love or the foibles of his acquaintances. A wise man, indeed, will live as much within his wit as within his income, and it is far better to be content with good sense and reason, which can never hurt, than with this shining but cutting plaything of wit. However you may be admired for your sharpness of repartee, it is still true that respect and affection can be won only by good sense and amiable consideration of the feelings of others.

There is a species of minor wit, that known as raillery, which is much used, and much abused. It is a dangerous and mischievous weapon in unskilful hands, and had better be left entirely alone. In truth, the injustice of a bad man is often more quickly forgiven than the insults of a witty one. The former injures us in property; the latter hurts us in soul, mortifying that secret pride which we all possess. Raillery, indeed, is not always offensive; it may even be used to flatter, as when we accuse one of faults which they are notoriously free from. But this sort of raillery needs a skilled hand to manage, and had better be left quite alone if it cannot be handled judiciously.

All can be Agreeable.

It is not given to every man to be a brilliant talker, or to express himself in writing with elegance or force. Both of these are gifts of the few, not possessions of the many. There is, however, no reason why any person who goes into society should be ignorant of the rules of polite intercourse, or fail to master all the customary forms of address.

It is almost useless to repeat that your conversation should be adapted to your company, for that is a golden rule which one should know almost by intuition. In mixed groups one should sedulously avoid all such mooted points as politics and religion, and every topic likely to excite argument or lead to heated discussion.

You cannot be too careful in avoiding, in mixed assemblages, subjects which may prove to point directly to some persons present. For instance, do not speak of the laxity of the divorce laws when Mr. M. or Mrs. N. may, unknown to you, have passed through the divorce court. And do not express yourself strongly against second marriages, when there may, perhaps, be one or two examples among your listeners. If a sudden silence, with perhaps a conscious look, follows your words, you had better change the subject as quickly as possible, and be glad that you have escaped from a hornets' nest without a sting.

Avoid Referring to Your Own Exploits.

Talk of yourself and your own affairs as little as possible, and bear in mind that to drag into a general conversation the names of distinguished persons to whom you may be related, or who may be numbered among your friends, is more apt to excite contempt than to yield admiration. To speak of your own exploits, or give examples of your special prowess and sagacity, without request of the company, is always in bad taste, and is more likely to gain you credit for self-conceit than for the qualities boasted of. Leave matters of this kind for people to find out and you will gain more credit.

Above all, avoid any effort to monopolize the conversation. It is presumptuous and offensive in any person to imagine that his or her words alone are of interest, and impolite to rob others of the opportunity to speak. This is a common fault in fluent talkers, who are, besides, often so interested in what they wish to say as to be plainly inattentive to what others are saying.

Personal allusions or flattering remarks are often in very bad taste. Words spoken in jest may be taken in earnest, and should be guarded against unless you are with intimate friends, who will not be likely to put a false construction on your words. If you intend a jest, you are wasting your effort if your point cannot be seen.

Puns and slang terms should, as a rule, be avoided. They at times fit in neatly, but a habit of indulging in them is a bad one. It must be remembered that there is a slang of the mansion as well as of the hovel, of the drawing-room as of the street. The technical terms of professions or trades have occasionally the effect of slang in general society, and simple, plain language should always be used in preference. It is not always advisable to bring the phrases of the office or the factory into social circles.

Express yourself simply and clearly. Avoid all attempts at elegance or pomposity. Use the easiest and plainest language you can, and stop speaking when you have said what you desired. "Brevity, is the soul of wit," therefore "speak little, but speak well, if you would be thought a person of good sense."

Other Rules Worth Observing.

Should a person enter the room in which you are conversing, and the conversation be continued after his arrival, it is only courteous to acquaint him with the nature of the subject to which it relates, and to give him an idea of what has passed.

Be cautious in relating anecdotes. Unless you can tell a story with ease and effect, it is better not to attempt it, and, above all, do not mimic the peculiarities, infirmities, or short-comings of others in general society. You may give offense to some one present who is a friend of the person caricatured, and in any case such a proceeding is not commendable.

Do not speak of what passes in a house that you are visiting. To do so may often give great offence.

You need not tell all the truth unless to those who have a right to know it all. But let all you tell be the truth.

Do not offer advice unless you know it will be followed, and carefully beware how you advise an angry or an opinionated person. As a rule, advice not asked is not welcomed.

Be cautious as to asking questions. The reply may be very embarrassing to the person of whom the question is asked.

Do not volunteer information, especially in public; but be very sure you are correct in what you state as facts.

Do not sit dumb in company, but bear your share in the general conversation. Do this with modesty and self-possession, neither thrusting yourself forward, nor hesitating where you should speak. It is better to be a good listener than a good talker, yet it is a duty to take your part in entertaining.

It is not necessary to express your opinions upon all subjects; but if you give utterance to them, do so fearlessly, frankly, and with courteous regard for the opinions of others. The greater your learning, the more modest should be your manner of expressing it.

A Winning Manner.

Another important element of social deportment is a graceful and easy bearing, and that softness and amiability of manner which is so engaging in our intercourse with the world. Such a manner is more easily felt than described. It is a compound of several elements of character and conduct; not a servility of demeanor, but an affability and courtesy in speech and expression; and this, whether or not you agree with the person or persons with whom you are conversing.

This should be particularly considered when we are obliged to refuse a favor asked of us, or to say what cannot be very agreeable to the person to whom we say it. If we have a bitter pill to administer, we should at least seek to sweeten it with courtesy and kindness. Yet this softness of manner will sink into a mean and timid complaisance, or insincere affectation, if not supported by firmness and dignity of character; and one should, while cultivating courtesy, be careful to avoid insincerity or fear of truthful expression. To be winning at the expense of truth and honesty is to convert a virtue into a fault.

Genuine easy manners result from a constant attention to the relation of persons and things, times and places. When we converse with one much superior to us in station or in the world's appreciation, we should seek to be as easy and unembarressed as with our equals, avoiding sedulously any show of servility or flattery, yet indicating in word, look and action, the greatest respect. In the society of our equals greater ease and liberty are allowable; but they, too,

have their proper limitations. There is a social respect in every case necessary, and though our language may have a greater degree of latitude among friends and equals, its freedom should never be unbounded. It is always safer to say too little than too much.

An engaging ease of carriage and behavior widely differs from negligence and inattention, and by no means implies that one is justified in consulting only his own pleasure in society; it only means that he should not be formal or embarrassed, disconcerted or diffident. It need only be said that the thing it is correct to do should be done with ease and ability; the improper thing should not be done at all.

In mixed companies different ages and sexes should be differently addressed. Although it is our duty to be respectful to all; old age particularly requires to be treated with a degree of deference and regard. It is a good general rule to accustom ourselves to have a kindly feeling towards every thing connected with our fellows, and when this is the case, we shall seldom err in the application. The inward feeling will appear in the outward conduct.

Principles of Politeness.

Another important point in decorum is, not to force upon others our own present humor or passing sentiment, but to observe and adopt theirs. If for the moment we are impressed with some strong feeling or in a humor out of tone with that of the company, we should either restrain ourselves, keep silent, or confine our conversation to those who are most likely to be in sympathy with our frame of mind. Peremptoriness and conceit, especially in young people, is contrary to good breeding: they should seldom seem to dissent, and always use some softening mitigating expression.

There is a decorum also with regard to people of the lowest degree; a gentleman observes it with his coachman, and even indeed with the beggar in the street. He considers them as objects of compassion, not of insult; he speaks to neither in a harsh tone, but corrects the one gently, and refuses the other with humanity.

Politeness is one of those social virtues which we never estimate rightly but from the inconvenience of its loss. Though perhaps not distinctly perceived when present, its absence is strongly indicated. The difference between a polite person and one who is impolite is very marked, yet those who do not possess good breeding rarely understand its importance and worth. But as sickness shows us the value of health, so a little familiarity with those who do not trouble themselves to contribute to the gratification of others, but regulate their behavior merely by their own will, will soon make evident the necessity of established modes and formalities to the happiness and quiet of common life.

Wisdom and virtue are by no means sufficient, without the supplemental laws of good breeding, to secure freedom of manners from degenerating into rudeness, or prevent self-esteem from developing into insolence. Incivility and neglect of proper social observances do not necessarily yield remorse of conscience or reproach from reason in those who have not been taught to consider the feelings of others as well as their own. Yet genuine politeness always gives ease and pleasure, while its opposite is likely to impart pain or disgust. The power of pleasing must in great part be conferred by nature, though in a considerable measure it may be cultivated. But though it be the privilege of the few to charm and shine in society, yet all may hope, by the cultivation of good breeding and polite manners, to make themselves agreeable to their associates, though they should have no claim to higher distinction.

The axiom from which flows all the formalities of cultivated society is: "Let no man give preference to himself." This is a comprehensive rule, and it is difficult to imagine an incivility unless it is in some measure broken.

Good Breeding.

Yet there are everywhere particular ceremonial requisites of good breeding, often of local application, which, being arbitrary or accidental, can be learned only by residence and observation. Among these are forms of salutation, gradations of reverence, and various rules of place and precedence. Yet these may be violated without giving offence

by one who is evidently a stranger to them, and when it is apparent that neither malice nor pride had a share in their non-observance. And however rigidly these and other rules of behavior be observed, they can never condone insolence or selfishness. True courtesy is that which flows from the heart, not that which is worn only on the surface.

Real good breeding is not always to be found among those who spend their time in visiting, in frequenting public entertainments, in studying ceremonial rules, and in keeping in pace with the changes of fashionable regulations. Such people may know what fashion demands in acts of deportment and ceremony, but they too often confine themselves to the exterior and unessential elements of civility, and are much too apt to consider their own gratification as of more value than the pleasure of others.

The most certain way to give any man pleasure is to persuade him that you receive pleasure from him, to encourage him to freedom and confidence, and to avoid any such appearance of superiority as may overbear and depress him. We see many who, by this art alone, spend their days in the midst of caresses, invitations, and civilities; and, without any extraordinary qualities or attainments, are the universal favorites of both sexes.

In assemblies and places of public resort it is frequently observed that at the entrance of some particular person every face brightens with gladness, and every hand is extended in salutation. Yet, often, if you follow this favorite beyond the first exchange of civilities, you will find him of only ordinary abilities, and welcome to the company simply as one by whom all conceive themselves to be admired, and with whom any one is at liberty to amuse himself when he can find no other auditor or companion. He can place all at ease if he will hear a jest without criticism, and a narrative without contradiction, laugh at every wit, and yield to every disputer.

All are at some hour or another fond of companions whom they can entertain upon easy terms, and who will relieve them from solitude, without requiring them to guard their speech with vigilance and caution. We are most inclined to love when we have nothing to fear, and he that encourages us to please ourselves, will not be long without preference in our affection to those whose learning holds us at a distance, or whose wit calls all attention from us, and leaves us without importance and without regard. All men dislike to be placed in such unpleasant contrast, even though they cannot but admire the abilities which they are incapable of rivalling or even unable to imitate.

The Demeanor of a Lady.

An agreeable, modest, and dignified bearing is not only one of the most desirable requisites of a young woman, but her best warrant to claim the title of lady. Whatever may be the transient demand of fashion, whatever the passing rule of custom, that which is amiable, graceful and true in taste will always please the majority of mankind. A young lady, if she have any true claim to the title, should not require to have allowances made for her. If properly trained, and blessed with a just conception of social requisites, her address will be gentle and polite, her manner courteous, and she will need but an opportunity for observation to gain those minor graces and habits which the local customs of society may demand. The general rules of social observance are world-wide in their application, and familiarity with them flows almost inevitably from good sense and a good disposition.

On being introduced to a stranger, there is no insincerity in the display of a degree of pleasure. The well-trained girl will acknowledge the introduction to an elder person with a respectful bow and a deferential manner. To one of her own age she will strive to make herself agreeable even if not particularly attracted towards the person introduced. It is the excess of impoliteness to let it be seen that she does not care for her new acquaintance, to look over her dress at once, as if taking an inventory of it, to wear a supercilious manner, or to appear hurried, as if anxious to get away at the first break in the conversation. Politeness demands that she should show a degree of pleasure in the introduction, and courtesy,

that she should avoid any action likely to give pain or offence.

Incivilities to be Avoided.

Such suggestions are hardly necessary. The instinct of a true lady will teach her to observe these basic rules of courtesy. Yet there is a heedlessness in many of the young, and an unacknowledged selfishness, which often lead to incivilities of which they are themselves unaware.

In conversation volubility is to be avoided. The words should be gently spoken, and the voice loud enough to be heard easily, but still with a degree of repression, an undertone below the full powers of the voice. Affectation especially should be avoided. It was once in fashion, but was always strained and unnatural, and, fortunately, has long ceased to be the mode. Like many peculiarities of bygone times, one meets with it now only in vulgar society. The well-bred sedulously avoid affected tricks of speech.

The manner of using the eyes also calls for regulation. The open stare and the shy withdrawal of the eyes are alike to be avoided. They should be raised quietly and with interest to those of the speaker, and only withdrawn when his remarks are concluded. This, of course, is not necessary if he is speaking to a number, but even then the eyes should not indicate inattention, and should be more or less steadily fixed on the speaker's face.

There is, in addition, a certain dignity of demeanor necessary to make even the most superior persons respected. This dignity cannot readily be taught; it can hardly be assumed; it must flow in great measure from intrinsic qualities, though even the finest natural powers may lose their influence through carelessness, and may be enhanced by attention and training. This dignity is distinct from pretension, which yields disgust rather than respect. A true lady will be equal to every occasion, and at home in all grades of society. Her politeness, her equanimity, her presence of mind, should be in evidence alike in the court and in the cottage.

Private vexations should never be allowed to affect a lady's manners, either at home or elsewhere. If not in condition for society, she should refrain from entering it, remembering that every one is expected and should hold herself bound to add something to the general sum of enjoyment. The self-control required in good society is often beneficial alike to the temper and the spirits.

Many a plain woman has won and kept the affection of others merely by being always gentle and womanly in manner. To gain an empire over the affections there must be somewhat of sentiment or sympathy in the nature of a woman. The loud, boastful, positive young lady will never be remembered with a soft interest, unless there be, perchance, some gentle strain in her that redeems her from her assumed hardness.

Flirtation.

With regard to flirtation, it is difficult to draw a limit where the predilection of the moment softens into a more tender and serious feeling, and flirtation sobers into an earnest form of devoted attention.

We all dread for our daughters hasty and questionable attachments; but it must not be supposed that long-practiced flirtations are without their evil effects on the character and manners. They excite and amuse, but they also exhaust the spirit. They expose women to censure and misconstruction, and tend to destroy the charm of manners and the simplicity of the heart. The coquette should remember that, with every successive flirtation, one charm after another disappears, like the petals from a fading rose, until all the deliciousness of a fresh and pure character is lost. On all these points a woman should take a high tone in the beginning of her life. She will learn, as time goes on, how far she may consistently lower it into an easier and more familiar tone of social intercourse.

The bearing of married women should so far differ from that of the unmarried that there should be greater quietness and dignity; a more close adherence to forms; and an abandonment of the admiration which has been received before marriage. All flirtation, however it may be countenanced by the existing custom of society, should be decisively put aside. There is,

however, no reason that conversation should be less lively, or society less agreeable.

If a young married woman wishes to be respected, and therefore happy in life, there should be a quiet propriety of manner, a dignity towards the male sex, which cannot be mistaken in her for prudery, since it is consistent with her position and her ties. She should change her tone, if that has been unrefined; she should not put herself on a level with young unmarried women of her own age, but should influence and even lead her youthful acquaintance into that style of behavior which is much esteemed by men of good taste.

Demeanor of a Gentleman.

One must be a gentleman before he can act the gentleman. To put on a semblance of what we do not possess is simply to expose ourselves to the world, which will not be slow in discovering the false show, and ridiculing or despising the hypocrisy. May good breeding be acquired as an art? Yes, in a measure, so far as dress, ceremonial deportment, and outward display of gentility go. One may ape the gentleman, even while not being the gentleman. Yet there is a something beyond this, visible in every word and tone, which makes the true gentleman, and to gain which one must train his heart as well as his manners.

In the well-chosen words of Ruskin: "A gentleman's first characteristic is that fineness of structure in the body which renders it capable of the most delicate sensation, and of that structure in the mind which renders it capable of the most delicate sympathies—one may say, simply, 'fineness of nature.' This is, of course, compatible with heroic bodily strength and mental firmness; in fact, heroic strength is not conceivable without such delicacy. Elephantine strength may drive its way through a forest, and feel no touch of the boughs; but the white skin of Homer's Atrides would have felt a bent rose-leaf, yet subdue its feelings in glow of battle, and behave itself like iron. I do not mean to call an elephant a vulgar animal; but if you think about him carefully, you will find that his non-vulgarity consists in such gentleness as is possible to elephantine nature; not in his insensitive hide, nor in his clumsy foot, but in the way he will lift his foot if a child lies in his path; and in his sensitive trunk, and still more sensitive mind, and capability of pique on points of honor. Hence it will follow, that one of the probable signs of high breeding in men generally will be their kindness and mercifulness; these always indicating more or less firmness of make in the mind."

What Constitutes Gentlemanly Manners.

The manners of a gentleman are the index of his soul. His speech is innocent, because it springs from a pure spirit. His thoughts are direct, because they are the exponents of upright actions. His bearing is gentle because it arises from gentle impulses and kindliness of heart. Pretentious manners are alien to the nature of the true gentleman. He avoids instead of exacting homage. Ceremonies do not attract him. He is as ready to do kindly acts as to say civil things. He regulates his hospitality by his means, but graces it with heartiness and sincerity of welcome. He chooses his friends for qualities akin to his own, his servants for truthfulness and honesty, his occupations for their elevating tendency or their power of giving aid or enjoyment to others. In a word, a good heart is at the bottom of all his acts, and a kindly spirit is the fountain from which all his thoughts arise. In this consideration it will not be amiss to quote from Ward McAllister the following apposite passage: "The value of a pleasant manner it is impossible to estimate. It is like sunshine, it gladdens; you feel it, and are at once attracted to the person without knowing why. When you entertain, do it in an easy, natural way, as if it was an every-day occurrence, not the event of your life; but do it well. Learn how to do it; never be ashamed to learn. The American people have a *greater* power of 'catching hold' and adapting themselves to new surroundings than any other people in the world. . . .

"If women should cultivate pleasant manners, should not men do the same? Are not manners as important to men as to women? The word 'gentleman' may have its derivation from gentle descent, but my

understanding of a gentleman has always been that he is a person free from arrogance and anything like self-assertion; considerate of the feelings of others; so satisfied and secure in his own position that he is always unpretentious, feeling he could not do an ungentlemanly act; as courteous and kind in manner to his inferiors as to his equals. The best-bred men I have ever met have always been the least pretentious. Natural and simple in manner, modest in apparel, never wearing anything *voyant* or conspicuous; but always so well dressed that you could never discover what made them so,—the good, quiet taste of the whole producing the result.

"Here all men are more or less in business. We hardly have a class who are not. They are, of necessity, daily brought into contact with all sorts and conditions of men, and in self-defense oftentimes have to acquire an abrupt, a brusque manner of address, which, as a rule, they generally leave in their offices when they quit them. If they do not, they certainly should. When such rough manners become by practice a second nature, they unfit one to go into society. It pays well for young and old to cultivate politeness and courtesy. Nothing is gained by trying roughly to elbow yourself into society, and push your way through into the inner circle; for when such a one has reached it, he will find the atmosphere uncongenial, and be only too glad to escape from it."

The Demands of Etiquette.

Etiquette makes many demands upon a man, demands which cannot safely be set aside, if he wishes to preserve the high title of gentleman. It is his duty to answer letters, notes, and invitations without delay. He must dress neatly; there is no need that he should dress lavishly. To dress well is to dress appropriately. He must be deferential to the old and courteous to the young, and yield place and precedence to women—the older in preference.

If he be afflicted with physical or mental ailments, let him bear them as philosophically as possible, and, at all events, avoid speaking of them in company. If he be placed under obligation, he should not let it remain any longer than he can help—if it be of a kind that can be returned.

It is not the large, but the little, things that often test and try a man's character and disposition. These make up the bulk of existence. We are rarely called upon to act the hero; we are daily required to act the gentleman.

"Among these trifles light as air," says a recent writer on etiquette, "is the ever-recurrent and not a little vexing question of the payment of fares in a car or omnibus by an acquaintance, and the adjustment of such matters."

In the opinion of this writer, there is only one rule about paying a lady's fare under such circumstances, and that is, "Don't offer to do it," unless called upon to do so through trouble on her part in making change or other exigency.

Women do not altogether like to be put under an obligation of this kind; some do not like it at all, feeling that it is not easy to repay. If she seeks to return the sum, it should be accepted without hesitation. There is no honor gained by attempting to appear magnanimous about a trifle.

Etiquette of Travel.

As regards offering a seat in a street car, that is a matter which should be governed by circumstances. There is no call for an oldish or tired man to give up his seat to a young woman, who is evidently better able to stand than himself. For a young man to give up his seat is a different matter, but in doing so preference should not be given to youth and beauty, as is too often the rule. True courtesy demands that the seat should be offered to the woman evidently least able to stand, no matter whether she be well or ill dressed, handsome or the opposite, rich or poor.

These instances are offered simply as examples of those small occasions for consideration and courteous demeanor which are of daily occurrence, and which are apt to be truer tests of character than many of the greater exigencies of life. There is a streak of selfishness, or, at the least, of self-indulgence, in us all to whose counsel it is dangerous to listen, if we desire to wear at least the outer aspect of a gentleman. The

man who is a gentleman by nature needs no suggestions on these small points; instinct will tell him how to act. Yet in all cases some training in the customs and observances of good society is of utility. The readiness to do the right thing is not all there is to consider. A knowledge of what is the right thing to do in the daily exigencies of life is of equal importance to all.

II. THE ART OF DRESS

The fashion of attire is a question of the passing day; its æsthetics is a question of the ages. Persons of taste will avoid the ridiculous, whatever may be the demands of fashion, yet will not vary so far from the prevailing custom in dress as to expose themselves to ridicule from singularity.

Dress has in it some of the essentials of the fine arts, and to be well dressed requires other requisites than the possession of wealth and a good figure. Good taste and refinement stand first; all other essentials come second. To dress well, the qualities of color, harmony, and contrast need to be observed, and a trained and artistic eye is as essential as a sensible and well-balanced mind. Dress, to be in good taste, by no means needs to be costly. Fit, proportion, and harmony in shade and color are the objects to be observed, and while there should be a reasonable consideration of the dictates of fashion, no person of sense will follow fashion blindly, to the neglect of the essentials of adaptation to figure, face, and occupation.

A Well-Dressed Woman.

Some one says that "as a work of art a well-dressed woman is a study." The toilette of such a person is always well-chosen, with consideration of its purpose, and is always adapted to the situation, whether it be breakfast-room or ball-room, promenade or reception. If she loves bright colors, and they agree with her complexion, they will be as harmoniously arranged as the tints of an artist. If subdued colors are demanded, she will not let any desire for display lead her into the use of garish tints. If she is young, her dress will be youthful; if she is old, it will avoid showiness. She will always rather follow than lead the prevailing fashion, and in no event will permit the costume of the day to lead her into violation of good taste and common sense.

The golden rule in dress is to avoid extremes. To affect peculiarities of costume shows a lack of good taste, while it is not less unwise to follow fashions which are unbecoming to the special person. Ladies who are neither very young nor very attractive in appearance will do best to wear quiet colors and simple styles; while those who are not rich can always appear tastefully dressed, if they exercise care in the choice, and display skill and judgment in the arrangement of materials. A dressmaker of good taste is an essential to good dressing. The dressmaker is a woman's good or evil genius, and may do much to make or mar her position in social circles.

Dress for Various Occasions.

Morning dress should be faultless in its way. For young ladies, whether married or single, there is no prettier summer morning wear than white or very light dresses of washing materials. Yet those must be always fresh and clean, and the collars and cuffs irreproachable. For morning wear simplicity in attire is imperative. Silk should not be worn. Cotton and woolen are the proper materials.

The walking-dress should be quiet. A rich or showy dress in the street is apt to attract more attention than is desirable or always agreeable. For the carriage, however, a lady may dress as elegantly as she wishes.

Elderly ladies should dress as richly as their means permit. A thin old lady may wear delicate colors, while one of stout person or florid complexion will look best in black or dark grey. But for young and old alike the complexion and figure have much to do with determining the suitable colors. Rich colors harmonize well with brunette complexions, but for blondes and those of delicate tints of face the desirable colors to be worn are those of more delicate hue.

MUSIC IN THE HOME

Henry Ward Beecher said: "The family that sings together often will be a happy family."
The above engraving is from a famous painting by Margaret Dicksee, exhibited in the Royal Academy, London. It represents the famous orator and playwriter, Sheridan, visiting the home of Thos. Lindley the Composer, whose daughter, a beautiful singer, he afterwards married.

At dinner parties, unless they be small and familiar in kind, only the fullest dress is appropriate. But at unceremonious dinners demi-toilette can be worn, and high dresses if the material be sufficiently rich. Real flowers may be worn at dinner parties, but it is better to wear artificial ones at balls, since the heat and dancing are apt to cause real flowers to droop and shed their petals.

Gloves, shoes, and boots must always be faultless. Gloves cannot be too light for the carriage, or too dark for the streets. A woman with ill-fitting gloves lacks one of the essentials of suitable dress. It may be remarked, by the way, that perfumes should be used only in the evening, and with the strictest moderation, and that perfumes to be tolerable must be of the most delicate kind.

There has never been a more telling and sensible criticism than that made by Dr. Johnson on a lady's dress. "I am sure she was well dressed," he said, "for I cannot remember what she had on."

Suitability of Apparel.

Suit your dresses to the occasions upon which they are to be used. In the morning, at home, a lady may wear a loose, flowing dress, made high in the neck, with a belt at the waist, and with loose sleeves fastened at the wrist. On the street a walking-costume should be worn, and the dress should clear the ground. There is nothing more disgusting than to see a rich dress sweeping up the dirt and filth of the street.

Fashion seems to decree this at the present time, with the ungraceful result of seeing nine women out of ten awkwardly holding up their skirts. The tenth sensibly ignores fashion in favor of comfort.

The shoes for the street should be high, warm, and easy to the feet, with a low, broad heel, and should be always neatly blackened. For ordinary street wear a lady may use either a hat or a bonnet. This is a matter of taste. In the dress of ladies great latitude is allowed; but the aim of all who aspire to be well dressed should be simplicity and taste, the character of the occasion being always carefully considered. Latitude or great variety in dress is no longer thought original, and startling innovations are dangerous experiments. With artistic taste they may prove a success, but are much more likely to be a failure.

It is important that a lady should always dress neatly at home. She is then ready to receive a morning caller without having to change her dress. She should change her dress for the evening. Some neat and dainty costume should be worn, according to her taste, for it is in the evening that she is thrown most with the male members of her family, and is most likely to have visitors. In making evening calls upon her friends, a lady should wear a hood, or some light head-wrap easily laid aside. A bonnet should always be removed at the commencement of such a visit.

Public Occasions.

The fashion of the time must govern the evening dress for public occasions. Full dress must always be worn, but it is impossible to give any fixed rule regarding it, in view of the frequent changes in the demands of fashion. A competent dressmaker, or the fashion publications of the time, will give the necessary information. In Europe, the evening dress requires the exposure of the arms and neck; but in this country the more sensible plan of covering these parts of the body is widely the fashion, and should be observed except on very special occasions.

The dress for balls and soirees should be of the richest within the lady's means. Yet a certain degree of repression is important, if one would avoid seeming overdressed. White kid gloves and white satin or kid boots are most suitable to a ball dress. If the overdress is of black lace, black satin shoes are worn. Hints and directions, however, are of little need to ladies for occasions of this kind. Example and experience, either of themselves or their friends, will prevent them from going far wrong.

The richest full dress should be worn at the opera. The head should be bare, and dressed in the most becoming style. Jewelry may be worn, according to taste, as there is no place where it shows to better advantage. A light or brilliant colored opera cloak will add greatly to the lady's appearance and comfort. Gloves of white, or delicately

tinted, kid only are to be worn. The ordinary walking-dress, however, is suitable for other places of amusement. A rich and elegant shawl may be worn, as it can be thrown off when uncomfortable. The sensible fashion is now making its way to remove the hat at theatres and lectures, out of due regard for those whose view of the stage may be obstructed. This being the case, there is no need to spoil the hair by wearing hat or bonnet on the way thither.

Plain and simple dress should be worn for church, with very little jewelry. The costume should be of quiet colors. It is a mark of bad taste for ladies to attend church elaborately or conspicuously dressed. It shows a disregard for the solemnity of the sanctuary, and is calculated to draw off the attentions of others from the duties of the place.

Jewelry.

Much display of jewelry is out of place for young ladies, and the kind of jewelry to be worn demands as careful consideration as that of the dress itself. Diamonds, pearls, and transparent precious stones generally belong to evening costume, and are always in taste at night; but they should not be worn in the earlier parts of the day. In the morning, indeed, only a simple ring or two are admissible, with, perhaps, a gold brooch, and a watch and chain.

As regards cost of jewelry, it is by no means the best criterion of taste. A simple and inexpensive jewel may occasionally have the effect of an exquisite work of art, while a large and showy brilliant may give the impression of vulgar display or showy overdress. To wear much jewelry in the streets is in very bad taste, while in large cities it may subject the wearer to danger from robbery.

In traveling it is inadvisable to make a display of jewelry. It is particularly undesirable if a lady is traveling alone, for the reason just given.

Traveling Dress.

Traveling costume should be simple in style and quiet in color, materials that will not show dirt being preferable. A waterproof cloak is a very desirable addition, as it may be at any time suddenly needed. In summer travel a long linen duster, belted at the waist, should be worn over the dress.

For the country or sea-side, simple and inexpensive dresses should be provided for ordinary wear. The bonnet should give place to a hat with a brim sufficiently wide to shield the face and neck from the sun.

Bathing dresses should be made of blue or gray flannel. The skirt should come down to the ankles, and the sleeves should be long. An oil silk or India-rubber cap, fitting tightly around the head, will protect the hair from the salt water.

It is impossible to prescribe an exact style or mode of dress for ladies in all places and on all occasions. Fashion will change, and, it must be confessed, in the matter of female costume, its changes have often been for the better.

In regard to "overdressing," it is not easy to draw a line, customs in different localities varying so much that what is permissible in one place might be utterly out of place in another. The usual thing for winter dress is a stuff dress—a "cloth suit," it is usually called—worn with a fancy bodice. For elderly women, with money enough to afford it, costumes of silk, with elaborate trimming, are often worn. With toilettes of this kind the custom of wearing lace is on the increase: but these are matters which the dressmaker is most competent to decide upon at any fixed period. As a general rule, however, loud colors should be avoided, and it is best never to risk extremes of costume, whether in or out of the line of fashion, if one wishes to escape the verdict of vulgarity.

A Well-Dressed Man.

Buffon has remarked that a man's clothes are a part of himself, and enter into our conception of his character. And certainly no man who is experienced in the ways of the world and has any regard for social opinion can consider the question of dress as unimportant. We may excuse a man who dresses very negligently, but we rarely hold him in any high regard. Our conception of the interior qualities of a person is influenced, more than we are ordinarily aware, by his exterior appearance.

Walpole truly says: "We must speak to the eyes, if we wish to affect the mind."

In paying a visit, or in mingling in good society, it is complimentary to our hosts to be well dressed, and shows disregard of their wishes to be slovenly in attire. Even in a casual meeting, or in cases where the costume is likely to be of minor consideration, neat and careful dressing is very likely to be of advantage. A negligent attire indicates that a man is heedless of the opinions of others, and indifferent to their good will or respect.

A careful and neat attire, on the contrary, indicates a man who has a regard for himself and for the sentiments of others, one who finds pleasure in social intercourse, and loves to mingle in the society of his fellows. It is a kind of general offer of acquaintance, and proves a willingness to be accosted. Dress is the livery of good society, and he who would advance in the profession of pleasing must pay due regard to his outward aspect.

Dress is also significant of inner feeling, and expresses qualities of mind which are likely to affect the outward conduct. That courtier was not far astray who dated the beginning of the French Revolution from the day when a nobleman appeared at Versailles without buckles on his shoes.

Fashion is called a despot; but if men are willing to be its slaves, we cannot, and ought not, to upbraid fashion. In truth, the man who rebels against fashion is often more open to the imputation of vanity than he who obeys it, because he makes himself conspicuous, and practically announces that he is wiser than his kind. Affectation is always the essence of vulgarity. Between the two it is left to the man of sense and modesty to follow fashion only so far as not to make himself peculiar by opposing it, and in whatever he does or whatever he wears to let good taste, common sense, and a proper regard for the opinion of his fellows be the guides of his conduct.

A prime requisite in dress is its simplicity, with which may be coupled harmony of color. This simplicity is the only distinction which a man of taste should aspire to in the matter of dress, for simplicity in appearance must proceed from a nicety in reality. One should not be simply ill-dressed, but simply well-dressed.

All extravagance, all over display, and all profusion must be avoided. The colors, in the first place, must harmonize both with our complexion and with one another; perhaps most of all with the color of our hair. All bright colors should be avoided, even in gloves and neck-ties. The deeper colors are, somehow or other, more manly, and are certainly less striking. The same simplicity should be studied in the avoidance of ornamentation.

Appropriate Costume.

You should dress according to your occupation and means. If you are a salesman, you would not think it appropriate to appear in the regulation garb of a bishop. Good sense and good taste form the first rule, and about the only one to be considered.

In the shifting climate of our country, gentlemen of late years have very sensibly adopted the mode of dressing especially for comfort. They have to brave all kinds of weather, sometimes wade through mud and slush, sometimes face a summer shower or cyclone, and they find it more essential to be protected against these climatic changes than to appear in elegant costume.

Their dress does not undergo so many modifications as that of ladies, and it is comparatively easy for them to wear apparel that will be simple and serviceable, and at the same time in good taste.

There is much less to be said about the dress of men than of women, as it is not subject to such extreme changes or susceptible of such great diversity in color, cut, and material. For the day the business suit is the usual costume, black or dark in color, with shoes of black or tan leather, and a derby or a soft hat. Those who desire a reputation for dressing well will scarcely appear in a high hat and tan shoes together.

Sack coats or cutaways can be worn with tweed or any rough cloth trousers and waistcoat, the weight and color being varied to fit the season. As evening approaches the sack coat and business suit should be replaced by a cutaway or frock coat. In

the country rough tweed suits, fancy flannels and any kind of hat may be worn, unless the gentleman is going to some special social entertainment, when he should dress much as in the city.

The Shirt Waist.

In the summer of 1900 the shirt-waist, which was worn almost universally by women, was emulated by men, many of whom assumed, during business hours, unstarched colored shirts worn without vests, while a waist belt replaced the usual braces. Often the coat was discarded. The comfort of this attire during the heated term was so great that the "shirt-waist man" promises to become a recognized summer institution.

As for evening dress, a considerable latitude of opinion concerning this prevails. During the warm season—from June to October—comfort demands much laxity in this respect. As evening dress is never seen in city streets without an overcoat, and as few care to swelter at the dictum of fashion, many men of sense content themselves with a neat ordinary dress. There is a variety of usage in this respect also at the theatre, and it is coming to be imperative to wear evening attire only at formal dinners or at certain fashionable assemblages which make it a requisite. In general, except during the summer, it is a safe rule for the denizen of fashionable circles to change his dress every evening, so as to be prepared for dinner or any other formal occasion. But as the denizens of fashionable circles compose a limited section of the community, an island in the sea of the multitude who claim no such exclusive honor, evening dress, as a general rule, is kept for special occasions, and men at home consider comfort and convenience far more than fashion.

III. INTRODUCTIONS.

The laws of society do not permit you to claim acquaintance with other persons unless you have been properly introduced, though in traveling this rule may often be reasonably omitted. Under ordinary circumstances care and discrimination should be exercised in making gentlemen acquainted with each other, and still greater heed is demanded in the introduction of ladies and gentlemen. It should always be understood in advance whether or not the lady is likely to desire the introduction. In no case should it be thrust upon her without regard to her objections. And it is not advisable to make the request within hearing of the party concerned, since this may put her in an awkward situation, if wishing to decline.

Do not forget that, in introducing one person to another, you assume a social responsibility for the person you introduce, and great care should be taken in giving this indorsement. It is possible for you to inflict a positive injury by introducing a man of objectionable character to a lady. If you are not well informed in respect to the reputation of the one for whom you are about to become responsible, pause and go no further. You should not be a party to the formation of any relations which may possibly have an injurious effect.

The same conditions hold good in the business world. An introduction carries with it some indorsement which may lead to business transactions involving great financial risks.

Rules of Introduction.

In England, visitors meeting in the same house are expected to enter into conversation, though no formal presentation has been made, and no previous acquaintance has existed. In the United States, however, the fashion of introducing people who meet as strangers still continues, though in certain highly fashionable circles the English fashion is affected. It, perhaps, has its advantages, in enabling visitors to converse freely without waiting for the formality of an introduction, and leaving them free not to know one another afterwards. But it has its disadvantages as well, especially in the case of shy and easily embarrassed people.

The American rule has long been to introduce generally, and in early society in

this country it was deemed necessary to make everybody in company acquainted, from a somewhat forced idea of the requirements of hospitality. This wholesale custom is no longer observed, and common sense prevails in this as in social customs generally.

One should always show discretion in this observance, as in all the demands of society. It is not, for instance, advisable to interrupt a conversation for the purpose of making an introduction. The intention will wait, and even if it fails altogether no harm is usually done. Few persons will thank you for making them too conspicuous.

Of the places where an introduction is not in order we may particularly instance a church. Here it would be quite improper, not only within the building, but even at its entrance. Nor is it necessary to introduce two persons at an entirely casual meeting—in a street car, for example, or if you happen to meet an acquaintance, whom your companion does not know, at some friend's door. Of course, if the chat should be extended, or if you think it desirable that they should know one another, an introduction is perfectly admissible; but it is in no sense incumbent upon you.

One further remark in this connection may be made, in reference to the frequent failure to catch the name of the person introduced. This often causes a feeling of embarrassment, and a somewhat awkward attempt to discover the missing name. "I didn't quite catch the name,' is the most ordinary way out of the difficulty, but something more original might well be attempted, as, "Pardon my inattention to Mr. C. I was so occupied with the honor offered me as to be deaf to the name"; or, less effusively, "Will you kindly tell me again whom I have the favor of meeting?"

The trouble is worse when you immediately forget the name, and are lacking in this particular on your second meeting with the new acquaintance. It is a useful accomplishment which all do not possess, that of remembering names readily; and to be obliged to make the worn-out admission, "Your face is perfectly familiar, but I have forgotten your name," is an awkward way out of the difficulty. Better try and get through the interview in a way to escape the need of using the name, and endeavor to learn it before another meeting is likely to take place. By repeating the name in acknowledging the introduction and fastening your attention thereto, it will not be difficult to remember the name.

The Introducer's Formula.

In introductions the common formula is: "Mrs. Blank, may I," or "allow me to present," or "introduce, Mr. Smith."

Never reverse this order, and so introduce the lady to the gentleman. When the sexes are the same, present the person of the lesser to the one of the greater age or importance.

Always mention the name in introducing members of your family. Say, "My father, Mr. Simpson," "My daughter, Miss Simpson," or "Miss Ellen Simpson." Your wife should be introduced simply as "Mrs. Simpson."

In introducing persons with titles, the title should always be distinctly mentioned. Thus, you should say, in presenting a clergyman to a senator of the United States. "Senator A., permit me to introduce you to my friend, the Reverend Dr. W. Dr. W. is the rector of St. M. Church, Boston." Then turning to Dr. W., say, "Senator A. represents the State of M. in the United States Senate."

Upon meeting strangers it is well to add some pleasant remark or suggest some interest in common between them. This will serve to put them at their ease and aid them to start a conversation. The party presented may simply say, "How do you do?" or "I am glad to know you," following it with such subject of talk as may occur to him.

Introductions do not necessitate future mutual recognition, unless agreeable to the parties introduced. The ceremony is simply an opportunity offered for present acquaintance, and can be ignored by one or both parties immediately after they leave the presence of the person who made the introduction:

A gentleman should never bow to a lady when first meeting her after an introduction, until she gives him some sign of recognition, thus intimating her desire to continue the

acquaintance. A gentleman should always return the bow, even though he may not care for the acquaintance.

Ladies and gentleman need not shake hands with each other when introduced. A bow is sufficient acknowledgement of the introduction. Persons of the same sex may or may not shake hands. In formal fashionable circles the hostess alone shakes hands, but ordinarily it is quite in order to offer the hand when introduced.

Persons meeting at the houses of friends when making morning calls need not be introduced to one another, and should not be unless there is good reason to believe that such introduction will be mutually agreeable. Nor is it proper for persons who have met in this manner, without introduction, to bow or express recognition otherwise should they again meet.

A person making a visit to your house should be introduced to every caller. At an evening party it is the duty of the host or hostess to make their guests acquainted with one another.

A gentleman should always promptly offer his services to a lady in any position of difficulty, whether he knows her or not. Her acceptance of his services does not give him any claim upon her acquaintance, nor need she feel obliged to recognize him afterwards without a formal introduction.

An introduction, however, gives one a claim upon the courtesy of another, whether the acquaintance be pleasant or the contrary. To ignore a person to whom you have been properly introduced is certainly an act of ill-breeding, and under certain circumstances becomes an act of insolence.

Salutations.

In meeting a friend upon the street, or in company, you should salute him cordially, but quietly and respectfully. A gentleman should always salute a lady by raising the hat and making a formal bow. In company, the head being uncovered, the bow alone is your salutation; but it should in either case, be a decided inclination of the head and body, not a mere nod.

In this country, among ladies, kissing is a common mode of salutation, even on the street. But indications are that this custom is less popular for hygienic reasons. Gentlemen generally shake hands, or in passing each other bow, or make a courteous motion of the hand. Even where you are not on good terms with a person it is courteous to bow to him. Should he fail to return the bow the offence is his, and you have lost nothing by your politeness.

The lady should bow first in meeting a gentleman on the street. It is her privilege to do so, as she thus shows whether she desires to continue his acquaintance or not. A failure on her part to bow first excuses the gentleman from saluting her. Among very intimate friends either party may salute first.

In riding, a gentleman raises his hat with his right hand, as the left is occupied with the reins.

When two or more gentlemen, walking on the street, meet a lady who is known to one only, all should raise their hats and bow. Those unacquainted with the lady thus show their respect for their friend's friend.

A gentleman when smoking, if meeting a lady acquaintance, should remove the cigar from his mouth and hold it down by his side before raising his hat to her. Above all, never smoke while walking or riding with a lady. She may not object to it, but that does not pardon your rudeness.

A young lady should treat an elderly person, either man or woman, with the same deference she expects at the hands of a gentleman.

Calls, Formal and Informal.

Residents of large cities should call in person upon all their acquaintances at least once a year, if circumstances permit, and should pay additional visits to all from whom invitations have been received. Calls should also be made when an engagement or marriage has taken place in the family of an acquaintance, or an acquaintance has returned home after a long absence.

The receipt of any especial hospitality, such as a dinner, luncheon, dance, etc., obligates that the recipient should call as soon thereafter as possible. If living at a distance a brief note to the host or hostess acknowledging the pleasure received is proper; especially is this expected after an ex-

tended visit. This is imperative, but it is not necessary after a five o'clock tea or an at-home, no one being obliged to follow one call with another. Such obligation as exists is for the party who gave the tea to return your call; and this is obviously impossible if her invitations have been very numerous. After being invited to visit a country house, a call should be made on those giving the invitation immediately after their return to their town residence.

In case of a newcomer to the street, or the city if a small one, older residents should call, and this visit should invariably be returned in person within a week. Etiquette permits a gentleman—a stranger—to call upon a lady under the following circumstances: If she has invited him to call, if he brings a letter of introduction, or if an intimate friend of the lady or of the family presents him.

Custom and courtesy require that a lady shall call on her lady friends at stated times, or at moderate intervals. These calls are generally short and formal in character. the conversation being devoted to society news and similar light subjects. Ten or fifteen minutes is the usual length of a formal call, half an hour the extreme limit. If while calling a second visitor arrives, the first visitor should take leave as soon as she can do so without seeming abrupt. Special friends of the hostess may linger for an hour if they wish.

In the large cities of the East such calls were formerly made between 11 A.M. and 4 P.M., but later hours in the afternoon are now the vogue, as from three to half-past five. Evening calls, unless in response to invitation or through mutual understanding, are out of order except in small communities. They may break into the dinner hour, or interfere with a theatre party or other outing.

Of course, these rules do not refer to the intercourse of intimate friends, the informal "running in," which may take place at any time in the day or evening, and need not interfere with any engagement. Gentlemen, as a rule, have only the evening to call in, but may call on Sunday afternoon after three.

A lady, in making a formal call, should not remove her bonnet or wrap. A gentleman, in a similar case, was formerly required, while leaving his umbrella and overcoat in the hall, to bring his hat and cane into the receiving room, either holding them or placing them on the floor by his chair. This rule, however, is no longer observed, and it is optional with the visitor to leave them in the hall if he prefers.

Ladies should make morning calls in simple toilette, and not in very rich dresses. Gentlemen wear morning dress.

Ending a Call.

When a call is ended it is customary among the best bred people to ring for a servant to open the front door for a visitor. Some persons prefer to attend visitors to the door themselves; and this should be done if a servant is not called upon. It is not courteous to let a visitor find his or her way out of your house unattended.

A lady should never attend a gentleman to the door; nor a lady either, if in so doing she is obliged to leave other lady callers in the drawing-room.

It is optional with the hostess whether or not to rise from her seat and cross the room to greet a visitor, or to accompany to the door a lady who is taking her departure, in case of no other ladies being present. But in these, as in all other cases where the rules of etiquette are not imperative, it is well to remember that the course which sets the guest most at ease will always be the choice of a kindly nature.

In making a call, if the lady called upon is not at home, leave your card; and if there are several ladies staying there whom you desire to see, request the servant to present your compliments to them severally. Should you not have a card, leave your name.

When a lady visitor takes her leave, a gentleman, if present, should rise, and offer to conduct her to her carriage. The offer may not be accepted, but if it is, do not forget to return and pay your respects to your hostess before quitting the house.

In case of other visitors entering during your call, your hostess is not obliged to introduce you to them, and you should take no offence at her failure to do so. In taking leave after their entrance, do so in such a way as not to make it appear that your departure is on account of their coming.

You may make visits of congratulation upon the occurrence of any happy or agreeable event in the family of a friend—such as a marriage, a birth, or the inheritance of wealth. Such visits should be made in the morning.

You should not defer a visit of condolence beyond the next week after a death occurs in a family. Among friends such visits are regarded as an imperative duty, except where contagious diseases render them dangerous.

In calling upon a person living or staying temporarily at a hotel, wait in the parlor and send up your card. Even intimate friends should observe this rule. A gentleman may wait in the office or hall of the hotel while the waiter takes up his card.

IV. VISITING AND VISITORS

Visits of friendship are governed by no set rules of etiquette, and need not be formal either as to length or manner. It is to be presumed that friends or relatives will conform to each other's tastes and habits, and conduct themselves in a manner that will be mutually agreeable. With intimate friends strict ceremony is uncalled for, yet there are certain liberties which you enjoy at home which are not proper to take in the house of a friend.

It is a sign of ill-breeding, in such a visit, to criticise the conduct of servants or children, or anything connected with the household or the members of the family. Remarks of any kind on the faults or foibles of persons belonging or closely related to the family are sadly misplaced; and such remarks made after taking leave show a lack of good feeling which is not redeemed by being unheard by those interested. In such cases one should strictly apply the golden rule of friendship, to do nothing by act, word, or deed that may cause a disagreeable feeling on the part of an entertainer or any member of his family.

Evening Calls.

In small communities, where it is customary to make formal evening calls after dinner, the usual hour is from nine to ten o'clock. In making an informal evening call, a lady may bring a gentleman with her, presenting him to her hostess, who will present him to her other guests.

The mistress of the house usually receives the visitors, being assisted by her husband or some other gentleman in the case of evening parties. The reception should be quiet, easy, and without over-ceremony. In some places it is customary to announce the names of guests as they enter the room. The host or hostess may then present them to other guests, if they are not already acquaintances.

When any one enters the room, whether announced or not, courtesy requires that the host or hostess shall rise at once, advance toward the visitor with words of welcoming, and request him or her to be seated. The seat offered should be one that seems most suitable to the age or sex of the visitor. If the master of the house receives the visitors, he will take a chair and place himself at a little distance from them; if, on the contrary, it is the mistress, and if she is intimate with the lady who visits her, she will place herself near her.

If several ladies come at once, we give the most honorable place to the one who, from age or other considerations, is most entitled to respect. If the visitor is a stranger, when the master or mistress of the house rises any person who may be already in the room should do the same, unless the company is a large one. When any of the company withdraw, the master or mistress of the house should conduct them as far as the door. But whoever the persons may be that depart, if we have other company we may dispense with conducting them farther than the door of the room.

If, upon entering a house where you wish to pay an evening call, you should find a small party assembled, it is best to present yourself precisely as though you had been invited. After a short while you may take your leave, explaining that you only intended to make a brief call.

Do not unduly prolong an evening visit. It is apt to become tiresome even to your most intimate friends, and, though they

politely exert themselves to be agreeable, it does not argue that they are not wearied.

Should you find a lady on the point of going out when you make your call, make it as brief as possible, in order to leave her at liberty to carry out her plans.

When you have risen to go, do not delay your departure.

When you are prevented from attending a dinner party, or social gathering, call upon the person giving it without delay, and express your regret for your absence. In visiting a city where a friend resides, it is best to go to a hotel, although he may have invited you to make his house your home. You can afterwards call upon him, and should he then urge you to accept his hospitality, you can do so wi h propriety.

When asking guests to visit you in your home, whether in the country or city, it is proper to fix the date of their arrival and of their leaving, whether the length of their visit is to be two days or a fortnight. If the desired duration of a visit should not be specified in the invitation, a considerate person will take care not to extend it over a week, and a shorter time would be still better. It is courteous, in every case, to state to your host how long you expect to stay.

In case of a visit without invitation, you should always write to inform even a near relative or very intimate friend of your intended visit, and the time you expect to arrive.

Among the leading duties of the host or hostess may be named the following: See that everything has been prepared for the comfort of the guests. Anticipate their bodily wants as much as possible. Direct that some servant shall go to their rooms twice a day and ascertain whether anything is desired, and whether any assistance can be rendered. Arrange so that they can be provided with cold or warm baths, as they may prefer, every morning. See that coarse towels or bath-sheets are within their reach. Have a can of hot water taken to each room at the hours of dressing. A pitcher of iced water and a glass on a tray should be placed in the bedrooms at night.

Entertaining Guests.

Do not bore visitors by constantly trying to amuse them. After means of amusement have been provided, let it be optional with them as to whether they avail themselves of these or not. Permit your visitors to enjoy the liberty of solitude and quiet if they prefer. Any apparent effort to entertain is always bad form. The every-day life of a family should not be interfered with by the arrival of guests.

Visitors should conform as much as possible to the habits and customs of the household. They should be moderate in their demands for personal attendance. They should not carry their moods into the drawing-room or to the table, and, whether they are bored or not, should be ready to contribute as much as is in their power to make an atmosphere of pleasure. If the above involves too much self-sacrifice, then an invitation to visit should not be accepted.

In case a lady guest is expected, some gentleman of the family should meet her at the train, or other place of expected arrival, look after her baggage, and make all arrangements requisite to enable her to reach your house without delay or discomfort.

Bidding Guests Adieu.

While it is not wise to disarrange the regular routine of a household on account of the arrival of a guest, a reasonable time should be devoted to the entertainment of the visitor. Receptions, excursions, etc., may be provided for, the places of note in the vicinity shown, and pleasant acquaintences visited or invited to call. The guest, on departure, should be accompanied to cars or boat, and cordially taken leave of on the departure of the conveyance.

Ladies or gentlemen of true courtesy will treat with kindness or politeness the servants of the family visited, and may reasonably remember with some gratuity those by whom they have been served. Simple presents may also with propriety be made to the children of the family. Costly or lavish gifts, however, are not in order, and have the ill effect of placing your entertainers under an obligation for which they may not mentally thank you.

Do not outdress the members of the family in which you are a guest, especially in attending an entertainment or place of amusement with them.

Enter heartily into the plans that are made for your entertainment or amusement. You should never permit your host or hostess to feel that he or she has disappointed you while seeking to add to your enjoyment.

Upon returning home after a visit, write immediately to your host or hostess, announcing your safe arrival; and be careful to send kind messages to each member of the family, mentioning all by name.

Engraved or Printed Cards.

The extent to which the use of visiting cards is sometimes extended furnishes occasion to some, unused to polite society, to ridicule what they call "pasteboard politeness," and yet these paper representatives of our personality are exceedingly useful things; indespensible, indeed, to the full discharge of social obligations.

In the selection of cards several things are to be considered; style, size, color, and character of writing. As for color, it should always be pure white. The size and shape are regulated by the prevailing fashion, but any attempt at display, such as fancy designs, gilt borders, odd shapes, etc., are considered vulgar by well-bred people.

The most tasteful card is an engraved one. The printed card comes next, then the written card. The fashion as to letters changes, but a plain script or old English text, well engraved, is always neat and in good taste. In case the card is written, it should be done in pencil rather than in ink, thus suggesting that its use is a matter of accident.

The proper size for a gentleman is smaller and more oblong in shape than that ordinarily used by ladies. If he have no title, "Mr." should precede the name. A lady's card should have the word "Mrs." or "Miss" prefixed to her name. The eldest daughter of a family needs "Miss" only before the family name. The younger daughters need the christain names also.

The titles properly placed on cards are those of army and navy officers, physicians, judges, and ministers of the gospel, but neither militia nor any other complimentary titles are allowable.

Ladies now usually have the entire name—with the prefix of "Miss" or "Mrs." engraved on their cards, as "Mrs. John Morris Eames," "Miss Edith Lloyd Richardson."

Custom sanctions the engraving of the address on all visiting cards, and some ladies have the reception day engraved in the left-hand corner. In some cities there is one exception to this rule. A young lady, during her first winter in society, does not use a separate visiting card, but has her name engraved on the card of her mother or chaperon.

A single gentleman, if he prefers, can have his club address engraved on his card, instead of the number of his residence.

A widow can use on her cards either her own or her husband's name, as choice may dictate; though she has legally no right to retain the latter, custom sanctions it.

Husband and wife must have separate visiting cards. It is no longer the fashion to have the two names printed together, as formerly.

Rules for Leaving Cards.

In making the first call of the season, a lady leaves with her own, her husband's card, and also those of her sons and daughters. After a dinner party, or other special entertainment, a lady leaves her husband's card with her own.

A married lady, in calling upon another married lady, should leave one of her own cards and two of her husband's—one of the latter being for the wife and one for the husband. If the lady called on has a daughter in society, the visitor should leave two of her own cards and three of her husband's. If there be another lady in the house besides the hostess two cards each of wife and husband should be left. When calling on a mother and daughters, a lady should leave two cards.

When paying a first call to several ladies—not mother and daughters—a card should be left for each. When calling on the guest of a house, a card should be left for the hostess also, even if she is a stranger to the visitor.

When calling at a hotel, it is allowable, and even desirable, to write the name of the person for whom the visit is intended upon the card, to avoid the chance of mistakes;

but this should never be done at a private residence. Cards should be left or sent on the day of a reception, if illness, a death in the family, or any other cause prevents the acceptance of the invitation.

Cards should not be turned down at the corners, nor bent over at one end—the fashion is now out of date.

In sending a first invitation to a person on whom the hostess has never called, cards should be enclosed with the invitation; but, if possible, a call should precede a first invitation.

After a proper interval of time, cards of condolence may be acknowledged (by sending mourning cards inclosed in an envelope).

No lady should use on her cards a suggestion of her husband's profession or titles of honor, such as "Mrs. General Brown," "Mrs. Dr. Smith," etc. Nor should she be addressed in this manner in conversation.

In case a person is going away, and likely to be absent for a length of time, it is proper to write p. p. c. on his or her card, and mail the same to acquaintances. The letters thus used signify "*pour prendre congé*," which translated from the French means "to take leave." Some write the English words out in full. Upon returning home your friends must first call upon you.

If death occurs in any household where one is in the habit of visiting, it is proper to leave cards upon the family within a month after.

When a gentleman calls after receiving hospitality, he should leave cards for all the ladies of the family and one for the gentleman representing the head of the house, whether young or old.

When a lady is paying merely formal visits she need not necessarily ask whether the lady upon whom she is calling is at home, but can leave cards simply, unless she is under obligation for some courtesy, in which case she must ask whether the lady can receive her.

It is better to leave cards in the hall when entering an afternoon reception or tea, as the hostess might otherwise not remember your presence, and a card left in person would afterwards remind her that she was your debtor for a visit—for if you attend an afternoon reception it is equivalent to a call.

If you receive cards for a series of "at homes," and for some good reason cannot accept the invitation, send your card on the last day named.

A card left for you during your illness should be answered by a call as soon as your recovery will permit.

Should you send a card to a person who is ill, the bearer should always make a verbal inquiry as to your friend's condition of health.

In making calls upon an intimate friend it is not necessary to send your card in. The simple announcement of your name is sufficient. The use of a card always has an air of formality about it. Where persons are on cordial terms, and are visiting back and forth frequently, a card can very well be dispensed with.

V. BALLS AND EVENING PARTIES

It is in the evening party that society puts on its gayest aspect, and is on its best behavior. Here everything is regulated by a strict code of observance, any departure from which opens one to critical remark. It is necessary, therefore, that the etiquette of the ball-room should be fully understood by all who claim admission to society.

These entertainments always include dancing and a supper. If large, they are called balls; if small, simply dances or parties. Balls are of two kinds, public and private, but there is no essential difference between the etiquette required on the two occasions.

As regards the giving of private parties or balls, the rule is, that ball-goers should make one return during the season. In doing so, it is in good taste to restrict the number of invitations as far as social obligations will permit, that the guests may not be overcrowded, and the unpleasantness of the "crush" may be avoided. To gain this desirable end, however, it is always safe to make the invitations in excess of the number desired, as some are sure to fail to come. One-third more than the room will comfortably hold may usually be safely asked. And experience shows that more

gentlemen than ladies should be invited, in order to secure an equal number of dancers of both sexes.

Invitations may be sent out from two to three weeks before the time fixed for the party. Less than two weeks is usually considered too short notice.

The hour for balls has, unfortunately, been made very late by the absolute dictum of fashion. Unless specially indicated on the invitation, a hostess cannot hope to assemble her guests before half-past ten, and in large cities the rooms are often not filled till an hour later.

Subscription Dances.

In most of the large cities several series of dances are arranged by certain leaders in the social world to which people are invited to subscribe. Each subscriber is usually entitled to a number of invitations for distribution, though in some instances the price of the subscription is small, and only permits one person to take advantage of each.

The subscription balls take place in some public ball-room, as a rule. In New York, for instance, at Delmonico's.

Several ladies are selected to form the reception committee, and they stand in one of the outer rooms, bowing to the guests as they enter. On such occasions, no one shakes hands; the ladies courtesy, and the gentlemen bow.

No unmarried lady should go to one of these balls, or to any large party, without a chaperon, and invitations should be sent to an elder member of her family, in order that she need not look outside for proper attendance.

In the West and South it is customary for gentlemen to take unmarried ladies to evening entertainments, but in the East, and in the best city society generally, such a thing would be considered the greatest breach of decorum. At a small dance in a private house a young lady may dispense with the services of a chaperon, if desired, but she should be escorted to and from the house by a servant or relative.

A good floor is essential to the enjoyment of dancing; when the carpet is taken up, care should be used that no roughness of surface is presented. Some ladies have their dancing-floors carefully polished with beeswax and a brush. A crumb-cloth or linen diaper, thoroughly well stretched over a carpet, is the next best thing to a polished floor.

The question of music is important. If it is a large ball, four musicians is the least number that should be engaged—piano, cornet or flute, violin, and violoncello. In small assemblies the violin and piano are sufficient, or, on occasion, the piano alone. In such a case a chance pianist should not be depended upon, but a professional one be engaged.

The orchestra should occupy what is considered the top of the room. In cases where it is not convenient to adhere to this rule, the end farthest from the door is usually chosen. The position of the orchestra needs to be considered by the dancers, so that, in quadrilles, their movements may be regulated thereby.

The Dressing Room.

A cloak-room for ladies must be provided, with maids to receive shawls and cloaks and to render such other assistance as may be required. It should contain several looking-glasses, and a supply of such articles as may be required in a lady's toilette.

A hat room for gentlemen must not be forgotten, with valets to wait upon them. It is best to provide checks for articles belonging to ladies and gentlemen left in charge of the attendants. Where checks cannot be had, tickets numbered in duplicate may be used—one being given to the lady or gentleman, and the other pinned to the coat or cloak. By this means the property of each guest is identified, and confusion at the time of departure is prevented.

Small fees of twenty-five or fifty cents are often given to servants in the dressing-room at a public ball, but never in private houses in this country, though the custom is common in England. Waiters should be on hand at supper to serve the meal, as the fashion of the gentlemen waiting upon the ladies is rapidly becoming obsolete.

In large cities, an awning should always be extended from the front door to the curb-

stone, on the occasion of a reception or other entertainment, as ladies do not like to step out of their carriages in light or elaborate dresses without some protection from the weather, and from the gaze of a curious crowd.

The Question of Toilette.

Ladies may wear as handsome dresses as they wish, and make their fullest display of jewelry. As everything about a ball-room should be light and attractive, it is in order for elderly ladies, who do not dance, to wear dresses more youthful in style and color than would be suitable for dinner, concert, or opera. For those who dance, silk dresses are, as a rule, objectionable.

Flowers are the proper ornaments for the head and dress. French ladies select them with reference to the season; but this is not insisted on in this country, and summer flowers may be worn at Christmas.

Ladies in deep mourning should not dance, even if they permit themselves to attend a ball. Should they do so, black and scarlet or violet is the proper wear. Where the mourning is sufficiently slight for dancing to be seemly, white, with mauve, violet or black trimmings, flounces, etc., is proper.

White gloves befit the ball-room; in mourning they may be sewn with black. They should be faultless as to fit, and never be removed from the hands in the ball-room.

The attire in which a gentleman can present himself in a ball-room is so rigorously defined, and admits of so little variety, that it can be described in a few words.

He must wear a black dress coat, black trousers, and a black waistcoat; a white necktie, white kid gloves, and patent leather boots. The waistcoat should be low, so as to disclose an ample shirt-front, fine and delicately plaited; it is better not embroidered, but small gold studs may be used with effect. Excess of jewelry is to be avoided. The necktie should be of a washing texture, not silk, and not set off with embroidery.

In the Ball-Room.

In a private ball or party, guests, on entering, should at once proceed to pay their respects to the lady of the house, who will remain near the door to greet them as they appear. Some of the gentlemen of the house should be near, to introduce to the lady any of their friends on their arrival. The daughters of the household are not required to assist in the ceremony of reception.

The fashion of carrying numerous bouquets to a ball is rapidly going out of existence, and many ladies refuse to take any flowers into a ball-room, the old custom having given rise to much vulgar rivalry and ostentatious display.

At public balls cards giving the order of dances are provided, on which gentlemen can write their names opposite the numbers of the dances for which they have been accepted by the lady holding the card. In England such cards are in general use, but they are rarely provided at private balls in this country.

From eighteen to twenty dances is a convenient number to arrange for, with supper as a suitable break at about the middle of the entertainment. A ball should begin with a march, followed in succession by a quadrille and a waltz. Then waltzes and quadrilles follow as may be arranged.

The cotillon or German, now so widely known, fills up the larger part of the evening, and begins, as a rule, immediately after supper. In a private house, the gentleman who has been invited to lead the German must ask the unmarried daughter of the family to dance with him, or the married daughter if so indicated as the family's choice. At the more general dances or large balls a young married lady is usually the one selected to dance with the leader.

It is quite the custom for a gentleman to engage a partner for the cotillon before the evening of the dance, and in this case, provided he can afford it, he usually sends her a bouquet of flowers. But should the lady request him *not* to remember her in this way her wishes should be respected.

Any gentleman, provided his acquaintance with the lady be sufficiently intimate to warrant him in doing so, has the privilege of sending her offerings of flowers whenever he cares to do so. In such a case he should go to a florist, leave an order for the kind of

bouquet he wishes sent, and also his card in an envelope addressed to the lady, which envelope should accompany the flowers.

Formerly, at public balls a master of ceremonies was considered always necessary, but this official is no longer provided, the management being now entrusted to a committee of arrangements, who are distinguished by wearing ribbons in the buttonhole, or rosettes. The members of the committee superintend the dances, provide partners for those who need them, and introduce gentlemen to ladies with whom they desire to dance.

In private balls, the lady of the house or some member of the family attends to introductions, and when she has grown daughters they may employ themselves in arranging sets, introducing partners, and the like, desisting from dancing themselves while any of the lady guests remain unprovided with partners.

Requests to Dance.

The former fashion of saying, "May I have the pleasure of dancing with you?" has now given place to a less formal method, and a young man may accost a young lady with, "I hope you have kept a dance for me," "Won't you spare me a dance?" or "Shall we take a turn?" A young lady does not answer, "I shall be very happy," a reply which has disappeared with "May I have the pleasure?" but may say, "I am afraid I have none to spare except number ten, a quadrille," or "I am engaged for the next five dances; but I'll give you one, if you come for it a little later," or something similarly appropriate.

Another form of invitation is, "Are you engaged for this dance?" An unsophisticated girl may answer by saying, "I do not think I am," while perfectly aware that she is not, and the young men are quick to see through the evasion by which the maiden seeks to conceal her lack of partners. A clever girl will escape from the dilemma by such an answer, as "I am glad to say I am not," thus inferring that she might have been engaged had she desired, but preferred waiting for the chance of dancing with him —a suggestion flattering to the gentleman.

Ball-room small talk is not expected to rise above the common-place. The materials supplied by the entertainment itself are very limited—the band, the flowers, the floor, the supper. Dull people usually ring the changes on these themes. For instance, "How well the band plays!" "What a pleasant ball-room this is!" "Don't you think the floor slippery!" "How warm it is growing!", etc., etc. Such phrases, by incessant repetition, grow wearisome, and those who can master any more novel phrases should make an earnest effort to vary the monotony. Nothing very serious or profound is in place, but almost any one can escape from such trite subjects as these.

In the Dance.

When a lady has accepted an invitation to dance, the gentleman offers her his right arm, and leads her to her place on the floor.

A slight knowledge of the figure is sufficient to enable a gentleman to move through a quadrille, if he is easy and unembarrassed, and his manners are courteous; but to ask a lady to join you in a waltz, or other round dance, in which you are not proficient, is an offence not easily forgiven, as it may expose the lady to awkward embarassment.

It is inadvisable to dance in every set, as the exercise is unpleasantly heating and fatiguing. Never forget an engagement—it is an offence that does not admit of excuse, except when a lady commits it; and then a gentleman is bound to take her at her word without a murmur. It is quite probable, however, that he will remember it against her, and take care not to be again victimized by her.

At the end of a quadrille the gentleman should offer his right arm to the lady, and walk half round the room with her. He should inquire if she will take refreshments, and, if she replies in the affirmative, conduct her to the room devoted to that purpose. It is good taste on the part of the lady not to detain her cavalier here so long as to prevent him from fulfilling his next engagement, since he cannot return to the ball-room until she is ready to be escorted thither, and resigned to her chaperon or friends, or to the partner who claims her promise for the next dance.

Taking Supper.

The gentleman who dances with a lady in the last dance before supper, conducts her to the supper-room, attends on her while there, and escorts her back to the ball-room. At a private ball, the lady of the house may ask a gentleman to take a lady down to supper, and he is bound to comply, and to treat her with the politest attention.

In either case a gentleman will not sup with the ladies, but stand by and attend to them, permitting himself a glass of wine with them; but taking a subsequent opportunity to secure his own refreshment.

Refreshments must be provided for the guests during the evening; and, as nothing should be handed round in the ball-room, a refreshment-room is necessary. This should, if possible, be on the same floor as the ball-room, because it is not only inconvenient, but dangerous, for ladies heated by the dance to encounter the draught of the staircases.

In the refreshment-room, lemonade, tea and coffee, ices, biscuits, wafers, cakes and cracker bonbons should be provided. Some persons add wine to the list.

The supper table should be set in a separate room. It is usually opened to the guests about 12.30 o'clock, and may consist of hot and cold dishes, including oysters, bouillon, game, croquettes, filet of beef, salads, pates, ices, cakes, sweets, jellies, fruits, and champagne, punch, lemonade and mineral waters, or such combinations or variations of these viands as may be decided upon. Small tables are frequently used at balls, so that four or six people may sit at one table and eat their supper comfortably in courses.

In private parties the character of the supper will, of course, depend upon the taste and resources of those who give the ball. To order it in from a good caterer is the simplest plan, but may often prove too expensive. If provided at home, let it be done on a liberal, but not too profuse a scale.

After the Ball.

Assemblies of this kind should be left quietly. If the party is small, it is permissible to bow to the hostess; but at a large ball this is not necessary, unless you meet her on your way from the room. It is important to avoid making your departure felt as a suggestion for breaking up the party, it being very impolite to indicate by your movements or manner that, in your opinion, the entertainment has been kept up long enough.

Finally, let no gentleman presume on a ball-room introduction. It is given with a view to one dance only, and will certainly not warrant a gentleman in going further than asking a lady to dance a second time. Out of the ball-room such an introduction has no force whatever.

If those who have danced together meet next day in the street, or the park, the gentleman must not venture to bow, unless the lady chooses to favor him with some mark of her recognition. If he does, he must not expect any acknowledgment of his salutation.

After a private ball it is etiquette to call at the house during the following week.

VI. BREAKFAST, LUNCHEON AND TEA

The hour at which breakfast shall be served is governed entirely by the habits and tastes of the family. Where it is very late, it is often preceded by the sending of coffee or tea, rolls and eggs in some form, to the bed rooms, the family, in such a case, not coming down to a general meal till about noon. Breakfast, however, is served in the same manner whether the hour be early or late, and this meal should always be quite free from formality.

A tea and coffee tray should be placed in front of the mistress of the house. It is quite within the rules of breakfast etiquette for people to wait on themselves and to help each other, and as the bread, small dishes, etc., are frequently on the side table, this is a very convenient fashion. One servant is enough in the dining-room in the morning, even though a larger number may be retained.

Ordinary courses for breakfast consist of three or four, such as hominy or oatmeal

first, then eggs, meat, or ham, and the chief portion of the food, followed by griddle-cakes and finally fruit. Toast should be freshly made, and sent up from time to time while the breakfast goes on. It should be always hot, as cold toast is never palatable.

Luncheon.

In imitation of the French, the meal which in our country is usually called "lunch" or "luncheon," is sometimes designated as "breakfast." It may either be formal, resembling a dinner, or informal, like the breakfast just described. It is served between 12.30 and 1.30, and the hostess may make it as simple or as elegant as she chooses. A formal luncheon party, however, differs little, if at all, from a dinner. If the occasion is a ceremonious one, the table is set in the same manner as for a dinner, and the dishes are handed by the servants; but the guests enter separately, instead of arm in arm.

At a large lunch-party either one long table, or several little ones, may be used. If the latter method is preferred, take care that the servants have ample room to pass between them. Each plate should have beside it two knives, two forks, one or two spoons, and a water-goblet.

The first course should consist of fruit or of raw oysters, or of bouillon or chicken consommé, served in cups set on plates, and provided with teaspoons.

This course is followed by an entree, chops with one or two vegetables, game or chicken, and salad, with sweets, candies, fruits, etc. Black coffee is usually served after luncheon.

In an informal lunch, if the hostess prefers, the sweets may be placed on the table in advance; but vegetables must be served from the side-board, and the chops, cold meats, etc., should be served by the hostess. Yet at such luncheons vegetables are frequently omitted, and in the selection of dishes the greatest latitude of choice is permissible. Among those most frequently served may be named oysters, croquettes, French chops, cold meats, beefsteak, fish, omelettes and salads.

At formal luncheons a bouquet for each lady is sometimes provided, they being grouped as an ornament in the centre of the table, and distributed after the meal. The custom is a pretty one, and worth encouraging. Occasionally, also, some pretty trifle is given to each guest as a memento of the occasion, but there is no obligation for this to be done.

Guests should be punctual in attendance on such an occasion, or send word promptly if prevented, by some sudden occurrence from coming. Either a white or figured table-cloth may be used, but it must be one that will wash.

These are rules which etiquette and good breeding demand shall be observed, not alone at luncheon, but at all meals. The table is the social centre, and it is essential that those who gather around it shall conform themselves to the most approved rules of good society. A knowledge of table etiquette is very desirable to possess, since many regard it as one of the surest tests of good breeding. It is at the dinner table, however, that strict rules of observance become indispensible. There is much more freedom allowable at the earlier meals of the day, and a digest of table rules may be left till we come to speak of the principal meal.

It may be said, however, in regard to conversation at the lunch table, that both etiquette and good breeding forbid indulgence in gossip, particularly in any sense ill-natured, and nothing can be more ill-bred than to make, after the meal, carping criticisms on the hostess and the entertainment she has provided.

Teas and Afternoon Receptions.

These are among the most informal entertainments given, and the difference between a large afternoon tea and an afternoon reception is little more than the name, though the latter is perhaps a shade more formal. They frequently take place at the same hour, and the character of the invitations and entertainments differ very little.

The day and hour of an afternoon tea may be written on a visiting card. For an afternoon reception, an "At Home" card is used. No answer need be sent to such an invitation, unless one is particularly requested, which is not ordinarily the rule.

It is necessary to speak to the host and hostess immediately upon entering the room, but owing to the constantly moving crowd it is not essential that guests should again address the host and hostess when they are about to leave.

The length of stay can vary from five minutes to an hour at an afternoon reception, but at an evening reception the time is usually more extended.

Only simple refreshments should be served at an afternoon tea. Thin slices of bread and butter, sandwiches, fancy biscuit or cake, tea, coffee, or chocolate, ice cream, and bouillon are offered. Punch and lemonade—but no wine of any kind—may be added if desired; and also salted almonds, cakes, candies, and other dainty trifles. English breakfast tea is now preferred, served with cream and white sugar, or slices of lemon for those who like tea made in the Russian style.

At an afternoon reception the table may be supplied with oyster-salads, pates, boned turkey, ice-cream, coffee, and bonbons.

For a reception music is desirable, as it adds greater brilliancy to the entertainment.

The hostess should shake hands with her guests and receive them cordially; any formality is out of place on an informal occasion.

If the number of guests is small, the hostess should walk about the room, talking with her visitors; if large, she should remain near the door, and have the aid of other ladies, who should entertain the guests, ask them to take refreshments, and make introductions when necessary.

At a large and elegant afternoon reception the windows may be darkened, the gas lighted, and musicians employed, if the hostess desires.

What is known as a high tea is a meal taking the place of a dinner, at which hot meats, cakes, warm breads, preserves and other sweets are served. Such teas are more popular in the country than in town.

At the informal tea, of which it is the custom to partake at about five o'clock in many households, a tray is brought in to the mistress of the house, and placed before her on a small table. This tray should contain a tea-service, cups, saucers, etc. The lady herself makes the tea, pours it out, and passes it to the members of the family or the visitors who may chance to be present. The servant brings in thin slices of bread and butter, cake, and, perhaps, English muffins, which are usually served with the cup of tea at this hour.

Suppers.

Supper, as a rule, is similar to dinner, and unless served at a ball or as a part of some other entertainment has very much the character of that meal. After the theatre or opera, people frequently indulge in some refreshment which may or may not be dignified by the name of supper.

Picnics.

If one person gives a picnic he must provide everything, the modes of conveyance to the place selected, the refreshments, entertainment, etc., but if several join in this the labor and expense should be equally divided.

The refreshments should consist chiefly of cold dishes, such as meats, boned turkey, sandwiches, salads, cakes, jellies, pies, etc., with lemonade, or such other drinks as may seem desirable. Hot dishes are sometimes served, prepared at a neighboring house.

Picnics are often so arranged that each lady attending furnishes a dish of some kind. In this way all the refreshments can be provided without any difficulty.

Sometimes a wooden platform is erected, and dancing is the chief amusement after eating.

A picnic generally lasts from about noon until twilight, and the best season of the year for such an entertainment is when it is pleasant to be out of doors.

Sufficient china, glass, etc., should always be provided, though they should be of a plain and inexpensive kind, for fear of breakage.

Theatre Parties.

A dinner, either at home or at a restaurant, is frequently followed by a visit to the theatre or the opera. In such a case it is proper for the one who gives the theatre party to invite an equal number of ladies and gentlemen, a proper chaperon, of course,

being provided. If the party are to dine together before going to the play, half-past six is usually the hour appointed, whether the dinner is to take place in a private house or in a restaurant. If there is to be no dinner, some house is selected where the guests assemble at a proper hour to reach the theatre in time.

It is customary, when you invite married people or gentlemen to the opera, to send them their tickets so that they may join you at the opera house, unless for some reason you wish to go with them. Unmarried ladies are usually asked to dine by their friends and go with them from their home. Suppers are rarely given after the opera, owing to the lateness of the hour. If the party did not dine together, however, it is customary for the host or hostess to give the guests a supper somewhere after the play.

It is the duty of the chaperon to see the unmarried ladies safely home.

Chaperons.

The word chaperon is French, and signifies a married lady, or one of sufficient age and dignity to accompany an unmarried one with propriety to any reputable entertainment.

Her services may be called upon, not alone for theatres, operas, concerts, balls, or other evening entertainments, but are demanded on many occasions during the day. No party of any kind which includes both sexes should be formed unless some married lady has charge of it.

The greatest courtesy and deference to a chaperon should always be manifested by the young ladies and gentlemen under her charge. Indifferent civility in this respect is the height of ill-breeding.

When an older lady passes a younger one in a ball-room and bows, the younger one should never remain seated when returning such a mark of recognition.

In leaving a room simultaneously, younger and unmarried ladies should always stand aside until the older or married ones have passed out.

The chaperon should behave with dignity, while being as genial and agreeable to the younger members of her party as possible. She should see that the unmarried ladies she has charge of reach home safely, and never leave them to a chance escort, no matter how tired she may be. One can never be too sure but that young girls may be exposed to unpleasant situations, if left without a companion of judgment and experience.

VII. BANQUETS AND DINNERS

The formal dinner is one of the most important occasions in social life, the test to which the degree of acquaintance of any one with the customs of good society is often put, the trial scene of good breeding and familiarity with polite observance. The rules to be observed at table are so many and minute that they require careful study, and many who pass muster on less formal occasions, may sadly err in some of the indispensible details of the etiquette of the table.

In ordinary, informal dinners, indeed, this strictness of observance is not demanded, and much more freedom is permissible, the home feeling here taking the place of ceremonious rules. Yet even here it is important to avoid falling into too great a latitude of action, since habits formed at home are very apt to accompany one abroad.

Choosing Guests.

In giving a dinner party, the first and often the most important question is, whom to invite. How many to invite follows as a problem of little less importance. For a pleasant dinner the number should be small rather than large, eight or ten being a fair average. An even number seems preferable, though this is not a matter of essential consideration.

Of course, large dinners are often a necessity, when given for business, family, or other reasons; and when display is the leading motive in giving the dinner, the number may be as great as the resources of the establishment will permit. But if comfort and the pleasure of social intercourse are the objects proposed, the number will need to be limited.

As to who should be invited, we have here a question that has sadly troubled many generations of hosts and hostesses. To bring together an incongruous mass of people is simply to invite failure. Guests should be selected with strict attention to a sense of fitness; and equal attention should be given to placing those of similar tastes together at table. The ease of conversation and the enjoyment of the dinner depend largely on this. Clever conversationalists are always most desirable guests. These are not always to be had, but even a single fluent talker often acts as a leaven that will rouse to speech a whole company of ordinarily quiet people. The invitation should be sent a week or two before the time fixed, or as much as three weeks if the affair is to be one of great formality.

Duties of the Hostess.

A dinner party is regarded by many persons as the most formal and, at the same time, the most elegant mode of entertaining guests—it is certainly the one which most severely taxes the resources of the hostess. Any woman not positively ill-bred can fill the position of hostess at a ball; but it requires tact, readiness, and a thorough knowledge of society to make a dinner party, in the ordinary parlance, "go off well." No matter how exquisite the china, glass, floral decorations, silver, and linen may be, if the hostess is a dull or awkward woman, the banquet will not be a success, for a proper selection of guests and the power of drawing them into gay and brilliant conversation are quite as needful as any of the material accessories.

The hostess should call into requisition all her tact and knowledge of society to set her guests at ease. No accident must disturb her. If her rarest china or most precious bit of glass is broken, she must appear not to notice it. If any one has had the misfortune to arrive late, she must welcome him or her cordially, though her duties to her other guests have not permitted her to wait in the drawing-room more than the fifteen minutes permitted by etiquette to the tardy. She must think only of encouraging the timid, inducing the taciturn to talk, and enabling all to contribute their best conversational powers to the general fund of entertainment. The same rules, of course, apply to the host.

The arrangements for dinner should be much the same whether the party be large or small, though, of course, the larger number will require a few extra servants, and may render advisable some extra courses. It should be remembered, however, by givers of dinners that too many courses are objectionable, and that in the best society of to-day fewer dishes are offered than was formerly the custom.

The hour for dinner should be fixed to suit the convenience of the guests and will vary in city and country. In the city it should be no earlier than seven nor later than eight o'clock, and the probability must be borne in mind that the guests will not all assemble till at least fifteen minutes after the hour named in the invitations. Tardiness of this kind was formerly considered rude, but has now become so common as to be expected and allowed for.

Arranging the Table.

In the centre of the table should be either a vase of flowers or a dish of fruit. Ferns make a very attractive effect. There should be small dishes of candies, figs, prunes, crystallized ginger, etc. Olives or radishes, salted almonds, etc., should be set in pretty little dishes on the table. These, with the silver, glass carafes of water, and wine decanters, complete the decoration of the table.

Everything else should be served from the side-table, and passed to each guest. This saves great confusion, and contributes more than anything else to the comfort of the meal. It is important also to have warm food served on hot plates. Cold plates will spoil the best dinner ever cooked.

The table cloth should be of the finest quality; and it is well for those whose means do not permit them to follow fashion's every caprice, to remember that fine white table linen is always in place. If colored materials are used, the latest edict of fashion forbids the employment of any stuffs that will not wash.

Decorations should always be arranged so that they will not prevent the guests

from seeing one another. The preference is now for low dishes of flowers of delicate perfume. Those of strong fragrance should be avoided, as in a warm room their odor may become oppressive.

An ostentatious display of flowers, plate, or ornaments of any kind is not in the best taste; nothing being more vulgar than a seeming desire to impress your friends with a show of wealth.

Placing the Table-Ware.

On the right of the space left for the plate place two knives and a spoon. The present mode is to use silver knives as well as forks for fish, and in that case this knife is placed with the others. On the left three forks—that for sweets smaller than the others. At times other knives, forks, and spoons are provided, but it is better to bring these in as needed for the separate courses.

The glasses are placed on the right. These should be at least four in number. As it is a great breach of decorum, as well as a sign of ignorance, to drink one sort of wine from a glass intended for another, we shall describe the glasses commonly in use. The tall glass, or that with the shallow, saucer-like top, is for champagne; the green for hock, chablis and similar wines; the large, ample glass for claret and burgundy; the round, full-shaped glass for port, and the smaller glass for sherry.

It must not be understood, however, that wines are essential to a high-toned dinner. Some of our very best families, the acknowledged leaders of fashion, never put champagne or any other kind of wine on their tables.

Each guest must be provided with a table-napkin, which, in laying the table, should occupy the place reserved for the plate.

There are many different and various ingenious ways of treating the dinner-napkin. The simplest is to leave it in the folds in which it comes from the laundress.

Bread should be cut in thin slices, and laid on a napkin at the left of each plate.

The room may be lighted with either white or colored candles or lamp. Many persons prefer to have the light fall in part from side brackets or sconces on the wall.

Dress.

As regards dress for a dinner party, it must be governed in great measure by the character of the dinner, whether friendly and informal, or an occasion of leading importance and marked formality. For the latter, lady and gentleman alike should dress as elaborately as for a ball, though ball dress and dinner dress should by no means be the same. The occasions differ widely, and the fitness of things needs to be strictly observed.

As to the character of the lady's dress, that must depend on her own taste. It will suffice to state here that full dress is requisite and that jewelry may be freely worn. For an ordinary, small dinner, however, a much less elaborate toilette is sufficient, and may prove more comfortable.

The gentleman will wear the ordinary evening dress already described. He may wear more jewelry than is in good taste earlier in the day.

Entering the Dining Room.

If the dinner is to be a large and formal one, a gentleman should receive an envelope before entering the drawing-room in which is a card bearing the name of the lady he is desired to take in to dinner. If he does not know the lady he should ask the hostess to present him to her. At small and informal dinners this is not necessary, the hostess simply mentioning to the gentleman the name of the lady he is wished to escort to the table. In fact, though still in use, the custom above named is going out of fashion, an assignment in the drawing-room being considered sufficient.

A card is generally laid at each place, giving the name of the guest who is to occupy it. This custom is also unnecessary at a small dinner. Menus, or bills of fare, are often placed before the guests at large dinners, but rarely at small ones.

When the guests have all arrived and the dinner is ready, the butler or waitress should enter the drawing-room and politely say to the lady of the house, "Dinner is served"; then he or she should return to the dining-room and stand behind the hostess until she is seated.

The gentleman of the house must offer his right arm to the lady who has been selected as the important guest of the evening, and then proceed to the table, placing her on his right. he generally taking the lower end of the table. The other guests follow, each gentleman with the lady selected for him; and finally the hostess enters with the gentleman whom she wishes to honor, he taking a seat at her right.

The remaining guests, in case their seats are not indicated by cards, will take the seats assigned to them by the host or hostess. In case no assignment is made, it should be remembered that questions of precedence, formerly so much considered, are growing to be of minor importance, particularly in this country.

Every place at a friend's table is equally a place of honor, and should be equally agreeable, so that, in the best circles, it is becoming the custom for the guests to sit in the order in which they enter the room. A little care should, however, be taken that a judicious distribution of the guests, according to their tastes, accomplishments, terms of intimacy, etc., is secured. Ladies sit on the right of gentlemen.

As soon as seated all the guests remove their gloves, and, taking the napkins from the table, open them and spread them on their knees. The napkin is not to be tucked into the waistcoat or pinned on to the front of the dress. It will usually contain a roll; that is placed on the left side of the plate.

The Dinner.

It is not easy to lay down any fixed rule for the character of the dinner. That must be governed by the season and the taste and resources of the host. However humble the pretensions of the dinner, it should never consist of less than three courses, namely, soup or fish, a joint (which, in a small dinner, may be accompanied by poultry or game) and pastry. Cheese with salad follows as a matter of course. Dessert succeeds.

The number of servants necessary will depend, of course, on the number of guests. Three will be enough for a party of ten or twelve persons. On their training and efficient service the success of the dinner will largely depend.

What is above said about courses applies, of course, to a very simple meal. In those of more pretension the courses may vary considerably in number and character, though custom lays down certain fixed rules for the succession of viands. For an ordinary dinner the following will suffice as an example.

Dinner Courses.

The dinner may begin with oysters on the half shell, five or six for each person. If not the season for oysters, small clams are frequently served in the same way. These should be very cold, and the clams are better if surrounded by cracked ice. A piece of lemon should be in the centre of each plate, and pepper and salt be passed with this course.

Soup follows. Either one or two may be served—a white and a clear, or a white and a brown soup; but never serve two kinds one after the other.

Follow the soup with fish. At the best tables you will find a silver fish-knife as well as fork; if not, eat with a fork in the right hand and a small piece of bread in the left.

When there are two kinds of fish, the larger one—say the turbot—is placed before the host; the lady taking that which is less calculated to fatigue in the helping. When fish sauce is handed, put it on the side of your plate. There are certain sauces appropriate to each kind of fish—as lobster sauce with turbot, shrimp or caper with salmon, oyster with cod, and so on.

The *entrees* follow, being ordinarily served in covered silver side-dishes. They consist of sweetbreads, *pates*, cutlets, and made-dishes generally. It is not customary to do more than taste one or two of these. Too much attention to them is apt to unfit one for enjoying the rest of the dinner. In eating of these dishes the fork alone, where possible, should be used.

The meats and vegetables follow. Some vegetables, such as asparagus, sweet corn, or maccaroni, can be offered by themselves; but hostesses should beware of making the meal tiresome by a needless number of courses.

It is not allowable, however, to serve more than two vegetables with one course,

nor to offer anything except potatoes or potato salad with the fish.

The roast meats are placed about the table in this way: The largest and most important, say haunch of venison, before the host; one before the lady of the house, and such dishes as tongue or ham before particular guests, who occupy seats at points where carving-knives and forks are placed in readiness.

Carving is an important accomplishment, and one that every gentleman should seek to acquire. A man should be able to carve a joint or a bird easily and dexterously, but facility can only be acquired by practice, which it is important to have. It is customary, however, to have the joint carved off the table, put back as before carving, and served.

It is hardly necessary to say that knife and fork are used in the eating of meat, poultry, or game; and it seems equally unnecessary to say that the purpose of the knife is simply to cut the food. Under no circumstances must it be used to convey it to the mouth. Vegetables are eaten with a fork. A spoon is rarely necessary, and a knife comes into use only in such cases as cutting off the heads of asparagus and the like.

If considered desirable, a course of vegetables may follow that of meat,—asparagus, cauliflower, artichokes, baked tomatoes, or some similar dish being served.

Game follows. Salad may be served either with the game or as a separate course. In the latter case serve with it cheese and bread and butter. The bread can be cut very thin and carefully buttered, or the butter and bread can be served separately. If preferred, the cheese can be served as a separate course.

Follow the cheese and salad with the sweet dishes and ices, then serve the fruit, and lastly the bonbons. Coffee may be served in the drawing-room, when the courses have not occupied too much time, or at the table, according to the preference of the hostess.

Black coffee, which should be made very strong and clear, must be served in very small cups, with tiny coffee-spoons.

After the Courses.

Everything except the lights and ornaments should be removed from the table before the dessert is served, the crumbs being brushed off with a crumb-scraper or a napkin, a clean one of course.

Finger bowls, set on handsome china or glass plates, with a fruit napkin or embroidered doily between, should be placed on the table for the fruit course. The dainty embroidered doilies, however, must never be used, and substantial fruit napkins should be supplied when any fruits that stain badly are served.

Where there is more than one servant, a second waiter carrying the proper vegetables should follow the first, who passes the meat or fish. The lady next the host should first be helped, and the others in turn, after which the gentlemen should be served. But when there is only one servant, the guests may be helped in the order in which they sit, beginning with the lady at the host's right, then passing to the one at his left, leaving the host himself to be served last.

When the servants have placed the dessert on the table and have handed the fruit and sweets once round, they retire. Any further service which the ladies may require can be given by the gentlemen, who will, of course, exert themselves to see that their neighbors are properly attended to.

Retiring from the Table.

Then the hostess bows to the lady of most distinction present, and all the ladies rise and prepare to retire. The gentleman nearest the door opens it, and holds it open for them. The hostess is the last to go out. While they are going all the gentlemen rise, and remain standing until they are gone. It would not, however, be a violation of etiquette for the gentlemen to accompany the ladies to the drawing-room at once, and what is here said applies principally to formal dinners, and to families in which the gentlemen are accustomed to conclude the meal with cigars and wine.

Tea and coffee are dispensed by the lady of the house in the drawing-room. This is her special province. It should be accompanied by a few wafers; a plate of very thin

rolled bread-and-butter and a few biscuits of the lightest description may be added. One cup of tea or coffee only should be taken; and certainly no one can need to be told that it must not be poured into the saucer to cool. It will be handed round the room by the servants.

In the drawing-room there should be a little music to give relief to the conversation.

At a plain family dinner, at which one or two guests are present, more devolves on the host and hostess, and less on the servants.

General Hints.

You should sit at a convenient distance from the table, and sit upright. Do not lean back, or tilt your chair, or stoop forward towards the table.

When grace is said at the table, observe the most respectful attention, reverently inclining the head.

Do not be impatient to be served. Should you need anything at the hands of the servants, do not order them to serve you, but request them politely, in a low, distinct tone, adding, "if you please." In declining a viand offered by them, say, "Not any, I thank you," etc.

Do not hesitate to take the last piece of bread or cake in a dish handed to you. Your host has more for other guests. When a plate containing food is handed to you, set it down before you, and do not pass it to your neighbor.

Wines.

As regards the use of wines at dinner, the following rules will suffice. They should be served in the following succession.

First.—Sherry, which must be very cold and decantered. This to be passed with the soup. If a white wine is to be served, it should be given with the oysters and also very cold. This must not be decantered.

Second.—Champagne, which should be packed in ice several hours before it is to be used. Serve it in the bottle with a napkin held round it to absorb the moisture. Champagne is passed with the meat.

Third.—Claret, which must be decantered and warm, and served with the game and salad.

Fourth.—Madeira, also decantered but of its natural temperature and passed with the dessert.

Mineral waters, such as apollinaris, can be passed at dinner, as some prefer a mineral to natural water. As has been already said, a glass suitable for each variety of wine is placed on the table. This is not the case with the Madeira glasses, which are kept on a side-table, and brought to the table after the glasses previously used have been removed and before sweets are served.

After dinner, when the ladies have left the room and the gentlemen are preparing to smoke, coffee, without milk, is served and carried to the ladies in whichever room they may be.

It may be said in conclusion that the custom of wine drinking during dinner, and of drinking and smoking afterwards, is no longer of so ordinary application as formerly. While still generally retained in the case of large and formal dinners, it is frequently omitted in small, and commonly in family dinners, being considered by many a custom "better kept in the breach than the observance."

Dinners at Restaurants.

When a dinner is given at a public restaurant, a table can be reserved in the public dining-room, or a private room can be engaged. It is usual to order the dinner beforehand, so that there will be no needless delay in serving it when the guests arrive.

If a lady gives the dinner it is better for the guests to meet at her house, so that they may all go together to the restaurant, but if an unmarried gentleman is the host he must appoint an hour for the party to meet him in the vestibule of the restaurant, and the lady who has consented to *chaperon* his dinner must be there very punctually, in order to spare any unmarried lady the annoyance of arriving alone at a public place.

The style of the dinner must rest with the taste of the host or hostess, but it should resemble as nearly as possible a dinner in a private house, both in table appointments, variety of dishes, service, etc.

It is perfectly admissible for an unmarried lady to dine at a restaurant, provided that she is properly *chaperoned*.

Lunches and breakfasts are, under the above circumstances, governed by the same rules as those given in regard to dinners.

Ladies may lunch or breakfast without gentlemen in respectable public restaurants, but two ladies should if possible be together, rather than that one should lunch or breakfast alone.

Of course, no one needs to imagine that in entertaining a few friends at dinner all this ceremony is indispensible. It belongs to occasions where formality and close attention to fixed social rules are considered necessary, but there is an agreeable form of informal dinner which calls for no manual of observance, in which the friends are taken into the bosom of the family and the ease of unfettered home intercourse prevails. For such dinners there are no set rules; every community, every family, make their own laws, and calmly ignore or simply laugh at the dictates of fashion. Here soup may be omitted, if not cared for; you may pass up your plate to your host for a slice of beef; you may do a dozen things that are quite out of order where formality prevails, and be as heedless and happy as you please. But all this is behind closed doors; when you fall under fashion's eagle eye no such looseness is for a moment to be considered; you must eat and drink to rule and measure or consider yourself a candidate for banishment.

VIII. COURTSHIP AND MARRIAGE

Preceding the marriage comes the courtship, an event which, since the world began, has been one of vital interest to man and woman, but which is so varied in its incidents and characteristics that no set rules of etiquette can be made to apply to it. It may suffice to say that when a gentleman feels such admiration for a lady as to induce him to make a proposal of marriage to her, it is the more manly and courageous way to do so verbally instead of in writing. During courtship anything that offends good taste, or is conspicuous in the conduct of a betrothed pair, should be sedulously avoided, —such as making public each other's sentiments. These concern the pair alone; they lack interest for the public at large, and etiquette demands that they should be kept secret.

A sufficient public announcement of the engagement is made by the ring, which it is usual for the gentleman to give the lady, as a token of the new relation existing between them. This may be a diamond solitaire, if the means of the gentleman will permit. Otherwise, a plain gold band is in order. It must be worn on the third finger of the left hand.

When the engagement is once formally made, it may be made known by the young lady or her mother to relatives and intimate friends. Good form, however, requires that the gentleman should gain the consent of the guardian or parents of the lady before making his proposal to herself. This is particularly important if he is in moderate circumstances and she wealthy.

The length of the engagement must depend largely upon the wishes of the parties most particularly concerned. Of late years it has become the fashion to shorten the time, and unless the marriage is likely to take place within six months it is better to make no public announcement of the engagement.

Hasty marriages, on short acquaintance, are in all cases to be avoided. The loving pair should grow to know each other well and intimately before courtship is allowed to pass its preliminary stage of attractive acquaintance; and many an unhappy marriage has come from undue haste in this particular, ardent fancy being permitted to take the place of cool reflection and growing knowledge.

There is a delight in courtship, moreover, which is often unwisely abridged by too quick a marriage. In the words of one wise maiden, who was asked why she did not marry when she had so many lovers, "Being courted is too great a luxury to be spoiled by marrying." But all this is matter for which it is useless to attempt to lay down rules. Men and maidens have followed their own inclinations in regard to the length of the period of courtship since

civilization began, and will probably continue to do so.

It is only when the engagement has been made and formally announced that etiquette can have anything to do with the matter. A couple once betrothed, and the betrothal made public, have placed themselves, in a measure, in the hands of society, and must yield in some degree to social obligations, if they wish to avoid invidious comment.

Wedding Preliminaries.

After the wedding day is fixed the happy couple are especially obliged to conform to the rules of etiquette, there being fixed laws laid down for every detail of the subsequent ceremonies. One thing should be borne in mind, that the wedding belongs to the family of the bride. It is their affair to send the invitations, provide the music, the decorations, the wedding breakfast, etc.; the duties of the groom being restricted to providing the certificate, naming the clergyman, and a few others. The announcement of the engagement is generally followed by a dinner given by the parents of the bride, to which some of the relatives of both families are invited. Subsequent dinners are apt to be given by relatives and intimate friends of the engaged couple.

The gentleman's parents, relatives, or friends call as speedily as possible upon the young lady and her parents or guardians. The selection of the wedding day is usually left to the choice of the bride-elect and her mother, and to their taste are similarly left such details of the occasion as the arrangement for the wedding, the character of the trousseau, or bridal outfit, the breakfast or reception, the choice of bridesmaids, the style of the ceremony, etc.

Any time of the year may be regarded as suitable for a wedding to take place, though certain periods, such as Easter week, are often preferred. In Europe there is a strange prejudice against the month of May. As regards the day of the week, Wednesday or Thursday are apt to be selected; while Friday is looked upon as unlucky. In this country Friday holds the same doubtful position, but any other day of the week, and any month of the year, are quite in order.

Marriage is regulated in this country by the laws of the State, a license being required in some States, and not in others. This the intending husband should procure, he being accompanied by the father, guardian, or near relative of the lady, that the requisite information required by the law may be given.

The bridal trousseau does not include plate, china, furniture, or any household ware, but is restricted to the bride's attire, of which sufficient is usually provided to last during the first few years of wedded life. Too great a quantity of wearing apparel is to be avoided, whatever the wealth of the bride or her family, since the rapid changes in fashion are likely to make some of it useless before it can be worn. The extent and character of the trousseau, of course, must be governed by the means and taste of the bride and her family.

Bridal Gifts.

The custom of presenting gifts to the bride has grown until it has become much of a burden and something of a farce, from the absolute uselessness of many of the articles sent and the annoying duplication that is likely to take place. In every case the presents should be in accordance with the means and probable style of living of the recipients, and as far as possible in harmony with their tastes and surroundings. Nothing is more ill-advised than to send some gorgeous ornament for a plain, simply furnished house. Simple, tasteful selections, however, are rarely out of place, and there is a wide choice of articles which every family can use. The variety is endless, ranging from the costliest silver and jewels, clocks, lamps, fans, odd bits of furniture, camel's hair shawls, etc., down to a pretty vase, a bit of embroidery, a picture, or a piece of china painted by the hand of a friend. No one should hesitate to send a present whose money value is small, such gifts are often the most welcome, and a present which owes its existence to the donor's own labor is regarded as especially flattering.

Gifts are usually packed where they are bought, and sent directly from the shop to the bride's house. They should be sent during the week preceding the wedding, and

not less than two days before the event. It is so customary to make an exhibition of the presents on the day of the wedding or the preceding day, that it is very necessary that they should arrive in good time.

The display of the wedding presents is a point to be decided according to the bride's wishes. Some people think it ostentatious, others devote much time and care to their arrangement, and it is undoubtedly gratifying to many to be permitted to see them.

One rule, however, is *invariable*—the bride must acknowledge every gift by a personal note. It must be borne in mind that the gifts are hers, her own private property, which she can claim from the hands of the sheriff, if misfortune supervenes, and leave by will to whom she elects. Of course, gifts may be sent specially intended for the groom.

If people do not know what to send, or what the young couple require, they should take some means to discover, for nothing is more annoying than to receive duplicate presents. It is not uncommon for soup-ladles, butter-knives, tea-urns, and other articles of table use or house-ornament to be given so profusely that the young couple are almost as well fixed to set up a store as to begin housekeeping.

It is customary for the gentleman to make his bride a present of jewelry to be worn at her wedding, where his means will permit him to do so. If a wealthy man, he often presents the bridesmaids with a souvenir of the occasion, a fan, bracelet, ring, or bouquet. He buys the wedding ring and furnishes the bride's bouquet; but there his privilege or duty ends. The bride's family supply the cards, carriages, and wedding entertainment.

Flowers.

The bride's bouquet should be composed exclusively of white flowers, such as gardenias, white azaleas, or camellias, with a little orange blossom intertwined. It is the privilege of the groomsman to procure and present this to the bride.

It is generally considered a delicate attention on the part of the bridegroom to present a bouquet to his future mother-in-law. This may be composed of choice variously colored flowers, whilst those of the bridesmaids should be white, with an edging of pale blush roses. These also are presented by the groom.

To save trouble and anxiety with regard to bouquets, it is the best plan to order them from some practical florist. He will know exactly what to send, and will deliver them fresh on the day of the marriage.

The Bridesmaids.

The bridesmaids are usually selected from among the sisters of the bride, or her cousins or friends. The head-bridesmaid is ordinarily her most intimate friend. Occasionally the sisters of the bridegroom assist as bridesmaids, but the bride's own sisters should always be given the preference.

The number of the bridesmaids, of course, must be governed by circumstances. Six is a usual number, though more are frequently selected. An even number must always be chosen.

The dress of the bridemaids is usually of some light white material. They frequently wear wreaths and veils, but of a lighter and less costly character than those of the bride. Bonnets are often worn instead of veils. It is desirable for them all to be dressed as nearly alike as possible.

In this country the bridesmaids either provide their own dresses or may accept them from the bride.

The Groomsmen.

The number of groomsmen must correspond to that of the bridesmaids. These gentlemen have little to do, with the exception of the first or principal groomsman, who is charged by the bridegroom with the management of the whole affair, and should be furnished by him with money to pay all the expenses. He is usually his brother or most intimate friend.

Where a ring is used he should take charge of it, and present it to the bridegroom at the proper moment. He must hand the minister his fee, and pay the sexton and other persons entitled to payment their legitimate charges.

It is his duty to undertake all the arrangements for his friend on the eventful

day, and to see that they are properly carried out.

The dress of the groomsmen should be similar to that of the bridegroom, the dress worn being that suitable to the hour of the day, in the same fashion as for any other entertainment. They should be dressed as nearly alike as possible.

The Bride.

After the wedding invitations are issued the bride does not ordinarily appear in public. On the morning of the wedding day she usually breakfasts in her own room, and remains there till the hour arrives to dress for the ceremony. It is the privilege of the bridesmaids to perform this service.

The bride's costume is, as a rule, of white, either silk or satin, or of material in accordance with the means of the parties. A bridal veil of lace or of tulle is usually worn. The gloves, of course, should be white, and the shoes of white kid or white satin. It is customary for the bride to make some slight presents to the bridemaids on the morning of the marriage. These should be simple, it being borne in mind that the gift is merely to serve as a memento of the occasion, and that no article of much value is demanded.

After dressing, the bride remains in her room until the carriage is announced, or the time has arrived to descend to the drawing room if it is to be a home wedding. The bride's carriage is the last to leave the house. It should contain but one occupant besides herself—her father, or the person selected to give her away at the altar.

The Ceremony.

The ushers are selected by the gentleman, though the lady is generally consulted in the choice. Six is the number ordinarily chosen, and their duties are to show people to seats in the church, and to present the guests to the bride and groom at the wedding reception. They, and the groomsmen as well, should all wear *boutonnières*, or button-hole bouquets, made of some handsome white flowers.

The bridal procession is formed by the ushers, who walk first two and two, followed by the bridesmaids, also two and two; then the child-bridesmaids, if this pretty custom is adopted, and then the bride, leaning on her father's right arm. Sometimes the children lead the others. At the altar the ushers separate, moving to the right and left, the bridesmaids do the same, thus leaving room for the bridal pair.

Upon the entrance of the bridal party within the doors of the church, the organist will play a "Wedding March," and as they take their places at the altar will change this to some low, subdued, but sweet and appropriate melody, which he should continue with taste and feeling throughout the service. As the bridal party leave the church, the music should be loud and jubilant.

The front pews in the church should be reserved for the families and especial friends of the happy pair. These are generally separated from the others by a white ribbon drawn across the aisle.

The wedding party should stand according to the positions decided upon by the wishes of the bride and groom. Usually the bride takes her place upon the left of the groom, her father stands a little in advance of the rest, behind the couple, and her mother just in the rear of her father. The bridesmaids group themselves on the left of the bride, the groomsmen on the right of the bridegroom, all in the rear of the principals.

The clergyman, who should be already in his place, at once begins the marriage ceremony.

When a ring is used, to avoid the long delay of drawing off the glove, brides now cut the finger of the one on the left hand, so that it can be slipped aside to allow the putting on of the ring; this is the routine almost invariably followed at church weddings.

The responses of the bride and bridegroom to the clergyman should be given clearly and distinctly, but not in too loud a tone. On the conclusion of the ceremony the newly-married couple and their attendants withdraw in much the same manner as on advancing, the bride now taking her husband's left arm.

The Wedding Breakfast.

The English fashion of a wedding-breakfast is now often followed in this country,

the guests being specially invited a fortnight in advance. On such an occasion the gentlemen, on reaching the house, leave their hats in the hall; but the ladies do not remove their bonnets.

In going to the table, the bride and groom precede, then the bride's father with the groom's mother, the groom's father with the bride's mother, the best man with the first bridesmaid, the other bridesmaids with gentlemen selected as their escorts, and finally the remaining guests. The dishes usually provided are bouillon, salad, birds, oysters, ices, jellies, etc.

The health of the bride and groom is proposed, usually by the groom's father, and response is made by the father of the bride. The health of the bridesmaids may also be proposed; but the occasion is ordinarily more pleasurable if strict formality is dispensed with.

After remaining for an hour or two with the guests, the bride retires to change her wedding dress for a traveling costume. She is met by the groom in the hall, the necessary good wishes and kisses are exchanged, and the pair drive away, often followed by a shower of rice and slippers.

As regards the desideratum of wedding cake, it is no longer the fashion to send it; but small boxes of it, neatly tied with white ribbon, are prepared, of which each guest may take one upon leaving the house, if desired.

What is above said relates to the marriage of a maiden. In the case of the marriage of a widow certain changes in dress and ceremony are requisite. A widow must never be attended by bridesmaids, nor must she wear a veil or orange blossoms; the proper dress at church is a colored silk and bonnet, pearl gray or some other delicate shade being preferable, though she is privileged to wear white if she desires. She should be accompanied by her father, brother, or some near friend.

A House Wedding.

A fashionable wedding at home calls into requisition the services of both florist and caterer; the former to decorate the rooms, the latter to furnish the marriage feast. A variety of floral devices may be employed, from the marriage bell and monogram to a bower of ferns large enough to receive the bride and bridegroom.

The part of the room to be occupied by the bridal party should be marked off by a white ribbon. After the clergyman has taken his place, the bride and groom enter together, followed by the mother, father, and other friends. Hassocks should be ready for the bridal pair to kneel upon, in case this is deemed necessary as a part of the ceremony.

Where money is lacking to defray the charges of florist and caterer, or in country localities where their assistance cannot be had, the loving hands of friends may decorate the rooms with foliage and blossoms, and the table be supplied with simple dishes such as the household means can furnish. Wedding-cake, light cakes, ices, and coffee arranged on a table prettily ornamented with flowers is a sufficient entertainment at a quiet home-wedding, and, let it be added, is in far better taste than a more ostentatious display which is beyond the means of the family, and leaves a burden of debt behind.

In fashionable circles, after the return of the bridal party the members of both families give a dinner in their honor, and the bridesmaids, if able to do so, give them some entertainment.

Brides sometimes announce, when sending out their wedding-cards, two or more reception days; but they do not wear their wedding-dresses, though their toilettes may be as handsome as they desire. When invited to balls or dinners, however, the wedding-dress is perfectly appropriate for a bride to wear—of course without the wreath and veil.

Sending Cards.

In some circles the young couple send out cards with their wedding invitations, stating the day and hour they will receive callers after their return from their wedding tour. No one who has not received such a card should call upon a newly married couple. Such cards should be as simple and unostentatious as possible. Where they are sent out, the wedding journey must be terminated in time to allow the new couple to be at home at the time indicated for the reception of their visitors.

Visitors should call punctually at the time appointed. In some places it is customary to offer the guests wedding-cake and wine. The mother, sister, or some intimate friend of the bride must assist her in receiving these calls. This rule is imperative.

IX. FUNERAL ETIQUETTE.

The great sorrow brought upon a family by the death of one of its members often renders the immediate relatives incapable of properly attending to the arrangements necessary for the funeral. The services of a near friend or a relative, therefore, are often availed of, he being informed of the wishes of the family, and relieving them of all further care, by himself taking charge of everything needing to be attended to.

The ladies of the family, before the funeral, see none except intimate friends, and may with propriety deny themselves even to those.

Immediately after a death the relatives and intimate friends of the deceased should receive some notification of it. An undertaker must also at once be summoned, and the arrangements and details of the funeral be left to him. Notices should be inserted in one or more of the daily papers of the time and place of the funeral services, etc.

In some parts of the country it is customary to send notes of invitation to the funeral to the friends of the deceased and of the family. These invitations should be printed, neatly and simply, on mourning paper, with envelopes to match, and should be delivered by a private messenger, where convenient.

A written notification, however, is frequently sent where only a few are to be specially invited, the newspaper announcement being trusted to inform those less closely connected.

The expense of a funeral should be in accordance with the means of the family. It is a foolish form of pride and ostentation that induces the members of a family to load themselves unnecessarily with debt in order to make a showy funeral display. All marks of respect should be shown to the dead, but undue expense is more indicative of a desire on the part of the living to impress their friends and neighbors than a genuine desire to do honor to the one who has passed away.

Where invitations are sent out, a list of persons invited must be given to the person in charge of the funeral, in order that he may provide a sufficient number of carriages. Those invited should not permit anything but an important duty to prevent their attendance.

The House Services.

When the funeral is at the house, some near relative or intimate friend should act as usher, and show the company to their seats.

A decorous silence should be preserved in the chamber of death, no one speaking except in low, subdued tones. The members of the family are not obliged to recognize their acquaintances. The latter show their sympathy by their presence and considerate silence.

The coffin, if in good taste, will never be unduly elaborate or over ornamented. A black cloth casket, with plain silver mountings, is preferable to any other.

The clergyman usually stands in a position as nearly as possible midway between the family and assembled friends, so that his words may be heard by all. The family remain seated together, usually in some room upstairs, and never appear until it becomes necessary to enter the carriages. If the funeral be in church, they occupy the front pews, the intimate friends sitting immediately behind them.

Six or eight of the most intimate male friends of the person who has died are invited by the family to act as pall-bearers. On the day of the funeral they assemble at the house, and the undertaker provides each of them with black gloves and a mourner's scarf. They walk with their heads uncovered beside the coffin, up the aisle, if the services be held in church, and also escort the body to the grave. They usually sit in one of the front pews, reserved for their use, while the funeral services are being conducted.

Flowers.

With regard to sending flowers, the wishes of the family should be considered. If you are uncertain upon this point, it is safe to send them. They should be simple and tasteful, also in keeping with the age of the person who has been removed by death.

As the sending of elaborate floral designs has been much overdone of recent years, it is becoming frequently the custom not to send flowers to houses of mourning, and in many funeral notices a request is made to this effect. Whatever flowers are received are usually placed upon the coffin during the services, and afterwards carried to the cemetery to be laid on or a few laid in the grave.

In preparing the body for the grave, the usual custom is to dress it in the garments worn in life; but young people are frequently laid out in white robes.

It is optional with the ladies of the family to attend the remains to the last resting place or not, as they may prefer. And of recent years the invitation is generally to the house only, notification being given that the funeral will be private. This is a judicious innovation, in the direction of economy and the avoidance of ostentatious display, and it is one that is likely to grow among people of taste and judgment.

After the funeral, only the members of the family return to the house, except in the case of friends or relatives from distant cities, and a widow or mother may properly refuse to see any others than her nearest relatives for several weeks.

Mourning.

The length of time for wearing mourning has greatly decreased during the past five years, as formerly there was such an exaggeration of this that sometimes the young people in a family were kept in constant black, owing to the death of successive relatives.

For deep mourning, black stuff dresses, heavily trimmed with black crape, and long crape veils, are worn. During the second period the crape is left off, and plain black alone is used; and for half-mourning light black, black silks, black and white, or costumes of mauve or grey, can be worn.

For gentlemen, at first plain black cheviot suits, with broad crape bands on their hats, and black gloves. For the second period they cease to wear black clothes, varying these by dark suits of black and grey, and the width of the crape hat-band is narrowed. For half-mourning the black hat-band is the one emblem of grief retained.

A widow should wear deep mourning for twelve months, plain black for the second year, and half-mourning for six months.

For parent, brother, or sister, the usual time of wearing mourning is one year; for a young child, six months; for an infant, three months.

There is much difference of opinion in regard to the wearing of mourning dresses, many objecting to doing so for what they consider excellent reasons. In truth, the mourning attire aids to keep up the feeling of grief, and to depress where some means of enlivening the feelings is desirable. Yet it serves as a protection to those whose deep sense of loss induces them to avoid many social duties, and who would escape from thoughtless and painful allusions. It is a matter, in short, that must be governed by the feelings and sentiments of those directly concerned.

During the first period of mourning it is not considered becoming to visit places of amusement or to enter social life or indulge in gaiety of any kind. After a certain time elapses—six months or a year, according to the depth of the mourning—a person is at liberty to go out quietly to concerts, theatres, informal dinners, etc.

It is customary to send a few words of sympathy to the family after a death has taken place. Such letters should be brief and written with real interest and affection, otherwise they had better be omitted.

During a period of mourning, note paper and visiting cards are usually edged with a black border, the width of this to be determined by the depth and recency of the mourning. The *very* wide band is exaggerated, ostentatious, and in bad form.

No invitations of any kind should be left at a house of mourning, until after a lapse of a month or more, according to circumstances. Then, cards to balls, weddings,

and general entertainments may properly be sent. When persons who have worn black are ready to resume their social life, they should leave cards with all their friends and acquaintances, either in person or by sending them through the mail.

X. ANNIVERSARY AND OTHER OCCASIONS

Among the festivities which society provides for its enjoyment, that of the anniversary wedding has of late years come greatly into vogue. It is a pleasant custom, and has been gradually extended until numerous anniversaries of the wedding day, differently named, are celebrated with appropriate ceremonies. Beginning with the silver and golden wedding, on respectively the twenty-fifth and the fiftieth anniversaries, there have been gradually added various others, such as the wooden wedding on the fifth, the tin wedding on the tenth, the crystal wedding on the fifteenth, the linen or china wedding on the twentieth, and, as an occasion of exceedingly rare occurance, the diamond wedding on the seventy-fifth anniversary of the marriage.

This is not the whole list, much ingenuity having been exercised in adding to the frequency and diversity of these anniversaries, and to those named may be added the iron wedding, celebrated after one year of married life; the paper wedding, on the second anniversary; the leather, on the third; the straw, on the fourth; the wooden, on the seventh; the ivory, on the thirtieth; the coral, on the thirty-fifth; the woolen, on the fortieth; and the bronze, on the forty-fifth. It is now a common custom, however, to overlook all the anniversaries preceding the silver wedding.

Gifts and Invitations.

A leading feature on these occasions is the sending of gifts, which are expected to be made of the material which gives the name to the wedding, and much ingenuity is exercised in selecting or inventing suitable presents, those of an amusing kind being often a leading feature.

Invitations to any of these occasions should be appropriate in design. For instance, the straw wedding cards may be printed on straw-colored stationery, the ivory wedding cards on ivory, and the bronze wedding cards in a similar way. For the silver wedding the cards may be printed in letters of silver, and in golden letters for the golden anniversary.

An appropriate form of invitation, say for a silver wedding, will be as follows:

1870. MR. AND MRS. BROWN 1895.
Request the pleasure of your company,
On Monday, June the Ninth,
At eight o'clock P.M.,
SILVER WEDDING.
WILLIAM BROWN. SUSAN CAMPBELL.

Many persons omit the names at the end, and in some cases an exact copy of the marriage notice, taken from the newspapers of the wedding period, is made to serve the purpose. A second form is here appended:

1850. 1900.
MR. AND MRS. HENRY WILSON,
At Home,
May fourth, 1900,
at eight o'clock P.M.,
GOLDEN WEDDING.

The entertainment may be similar to that supplied at any reception, with the addition of a large wedding-cake, containing a ring, which the bride cuts just as she did twenty-five years before.

As to character of the gifts, there is abundant scope for selection, with the general remembrance that they should be in consonance with the name of the anniversary. In the case of a wooden wedding, for instance, there is an opportunity for the bestowal of beautiful gifts in wood-carving, handsome pieces of furniture and picture frames, as well as the regulation wooden rollers, chopping trays, etc., for the kitchen. Bits of birch-bark are frequently used for the invitations.

Tin weddings have become occasions of special liveliness, and much ingenuity is exercised in devising amusing gifts. One young wife received from her father-in-law a check, marked "tin," enclosed in an elaborate tin pocket-book. The tin utensils

used in the kitchen and household furnish an abundant variety for choice. Tin funnels holding bouquets of flowers and tied with ribbons are usually numerous, and the glittering metal, adorned with bows of ribbon of every hue, is very effective when displayed on a table. The invitation is usually printed on a bit of tin.

On the fifteenth anniversary, or crystal wedding, the invitations are frequently crystalized, while the gifts may embrace every variety of glassware. The linen wedding is more rarely celebrated, many persons considering it unlucky. The Scotch have a superstition that if any allusion is made to this anniversary, one or other of the married couple will die within the year.

The silver wedding is usually a joyous occasion. The bride and groom are still in the prime of life, their children are of the age for a full enjoyment of festivity, and their circle of friends is likely to be complete.

Those who receive invitations usually send some present composed of silver, which may be as trivial or as costly as the donor chooses. They are generally marked "Silver Wedding," or bear some appropriate motto with the initials of the couple enclosed in a true lover's knot. The variety of articles is almost endless,—silver clocks, photograph frames, belt-clasps, mirrors, brushes and combs, and other toilet articles set in solid silver, and the long array of table-ware.

The golden wedding is a much less frequent occasion, and far less likely to be a joyous one. Age has crept upon the principals, and is creeping upon their children and friends, life has grown sober, and its pathway is apt to be strewn with many sombre memories.

As articles of gold are apt to be more expensive than many of those invited care to give, flowers are frequently made to do duty in their place—preferably yellow ones. As for the diamond wedding, the seventy-fifth anniversary, it is so rare an occasion that no description of it is necessary. Of course, it calls for presents of jewelry, though, as in the case of the golden wedding, guests may replace them with something less expensive and more appropriate to the age of the married pair.

Christenings.

Another occasion incident to married life, is the christening, which next demands consideration at our hands.

When children are to be christened at home, it is rapidly becoming the custom to celebrate such events by giving some sort of a social entertainment, the size or arrangement of which depends upon the taste and circumstances of the parents. If many are to be present, the invitations should be sent out formally, as though for an afternoon reception. The usual hours selected are from 4 until 6 P.M. Upon a small table a silver or china bowl should be placed, which is used as a font. Flowers in abundance are never in bad taste at a christening.

After the clergyman has performed the baptism, a beverage called "caudle" is served in cups to the guests.

Recipe for making Caudle.—This should be made of fine, smooth oatmeal gruel, flavored with wine or rum, lemon peel or nutmeg, and sugar added according to taste. Of course, in the case of a church christening no house-entertainment is called for, and a family party is all that is likely to come together.

Private Theatricals.

The private theatrical provides an entertainment which is daily growing in popularity both in England and our own country. Sometimes a stage is erected in a private house, but more frequently small theatres are engaged, where the performance takes place.

Instruction, or "coaching," is as a rule given to the amateur performers by some professional manager, actor, or actress engaged for the occasion, and is essential if any satisfactory entertainment is hoped for. Rehearsals are equally necessary and must be frequent to insure success.

For tableaux it is better to have the advice and taste of some clever artist, as the beauty and interest of the human pictures depend so largely upon the posing and drapery of the figures, to say nothing of the effect of the lights and the choice of colors.

Entertainments of these kinds may take a considerable variety of forms, and are very pleasant breaks in the monotony of

party giving and the other set affairs of ordinary life. The time spent in preparation, however, is likely to be considerable, and the result is often more farcical than the performers intend or understand.

Etiquette for General Occasions.

There are, or should be, rules of etiquette applicable to every situation, the home circle, the street, the store, the traveling conveyance, and in short for all the occasions in which men and women are brought together. These consist mainly in observing the ordinary requisites of politeness, the avoidance of rude or selfish behavior, and of any actions likely to hurt the feelings or offend the tastes of those with whom chance or social relations bring us into contact. It is not sufficient for the demands of society that we are morally correct; correctness in deportment is no less important, and there are numbers of small observances required from any one who wishes to keep on the correct side of the line which divides good manners from ignorant or boorish behavior.

Etiquette of the Household.

First among these requisites comes the etiquette of the home circle, in which the principle of politeness and courtesy are often laid aside as a consequence of careless habits and selfish egotism. Good manners are too often a cloak which is flung aside like a needless burden as soon as the home threshold is crossed, yet there is no place where kindness and thoughtfulness should be considered as more important, and in which neglect of the small courtesies of life are so likely to wound or distress.

Certainly the true gentleman or lady will endeavor to be as courteous and considerate in the family circle as among strangers, and equally avoid impatient and cutting remarks or lack of polite attention. Some few remarks on the rules of propriety for the home will not come amiss.

The house should be kept in as good order for the comfort of the family as when strangers are expected, and the members of the household should be careful to act in drawing-room or at table as if a guest were present. Formality, indeed, is not called for, but ease of manner does not imply rudeness, and politeness should never be laid aside.

Only a few leading suggestions can be here given. These will suggest others to all who attend to them. First, it is important to make special efforts to be punctual at meal time. Nothing interferes with the regular movements of the household, or disturbs the equanimity of the hostess, more than carelessness or irregularity in this respect. To have to keep food warm for the late comer, or perhaps to cook it afresh, is a needless waste of time and labor, and is apt to add to the household expenses.

Do not fail to rise and offer a chair on the entrance of an older person, or at all events an infirm person, to the room in which you are seated, and never precede an older person in entering or leaving a room, or in ascending stairs. Do not permit children to occupy the pleasantest seats, to the deprivation of their elders, or to be annoyingly intrusive when older persons are engaged in conversation. The "children's hour" should not be permitted to encroach upon that of their elders. Never enter any person's room without knocking.

Be careful to give any one who desires to read full access to the light. Avoid making unnecessary noise on coming home late at night, and in this way disturbing the repose of the household. Gentlemen who are in the habit of smoking at home should confine their devotions of the cigar to a single room, and avoid careless distribution of ashes or matches on floors or tables.

If callers are likely to drop in to meals, it is advisable to have a seat at the table reserved; and a room should also be set aside, where possible, for chance visiting friends. In every case a welcome should be ready, and every indication of being discommoded be sedulously avoided.

As regards the intercourse of the immediate members of the household, it will suffice to say that, while formality can well be laid aside, politeness and courtesy should never be forgotten.

Table Manners.

In conclusion a few rules of importance in table manners, familiar to most, but too

often carelessly ignored, may be given. The napkin should be spread over the knees, not fastened at the neck or tucked into a button hole. It should be folded after using, if the hostess folds hers.

The fork should be held in the palm of the left hand. If in the right, it should be used with the prongs upward, and held between fingers and thumb.

Avoid bending over the plate, drooping the head too low, thrusting the elbows out, or sitting with the back turned toward the person in the next chair.

Be careful not to take large mouthfuls nor to eat too hastily or heartily.

Never hesitate to take the last piece of bread that may be offered. A refusal to do so would be a reflection upon the hostess, suggesting that she had not provided fully for her guests.

In regard to rarer dishes, however, it is wise to show no inclination for more, if the supply on the table seems small.

Never play with napkin ring, fork, or other article, and keep the hands off the table when not employed. Never leave the table till the meal is over, and avoid reading newspapers, books, etc., at table unless alone.

Never use a spoon to eat vegetables. A fork is the proper thing. Never take butter from the dish with your own knife, or use it except on your own plate. It is scarcely necessary again to give warning against putting the knife in the mouth. Yet this unpardonable breach of table etiquette is often committed by persons whose training should have taught them better.

The table should be a centre of cheerful and enlivening conversation, and too close attention to the duty of eating should be avoided, alike from reasons having to do with healthy digestion, and the desirability of every one striving to bear a part in the entertainment of the family circle. The table is the one place where all the family meet at leisure, and where they should seek to make themselves agreeable.

Etiquette of the Street.

Courtesy requires the return of all civil greetings—those of servants included. Only the most serious causes can justify "a cut."

In bowing, the head should be bent; a mere lowering of the eye-lids, affected by some people, is rude. Etiquette does not permit a familiar nod, except between business men or very intimate friends. In passing and repassing on a public promenade or drive, bows need to be exchanged only at the first meeting. In carrying canes, umbrellas, and packages, care should be taken not to discommode passers with them. This is particularly needed in the case of raised umbrellas, which are often carried with careless disregard of the convenience of others. This is one annoying way in which selfishness is shown.

At a street crossing it is the duty of gentlemen to make way for ladies, and younger for older persons. In walking or driving, the rule to keep to the right will enable all to avoid danger of collision.

A gentleman should always offer his arm to a lady in the evening. In the day this is only in order in case of the pavement being slippery, there being a crowd, or the lady being old or needing support. If there are two ladies, he should offer his arm to one, and let the other walk beside her.

In the Electric Car.

If a gentleman desires to offer his seat to a lady, he should not beckon to her, but rise and offer it to her courteously. It is the duty of the lady, in accepting the seat, to acknowledge his courteous attention by a bow and an audible expression of thanks. On the other hand it is an indication of ill-breeding to show signs of displeasure if, on entering a crowded car, no seat is offered. It should be borne in mind that the gentleman has a right to his seat, and is under no obligation, except that of politeness, to give it up, and weariness or weakness may render it inadvisable for him to rise. No lady, if young or strong, will expect or permit an old gentleman to relinquish to her his seat. If, however, a lady is ill or greatly fatigued she should not hesitate to request a seat, giving her reasons for doing so. No gentleman, and few who are not gentlemen, would refuse such a request.

No gentleman will take a vacant seat while ladies are standing, and none should stand on the car platform in such a manner

as to discommode alighting passengers. It is easy and courteous to move aside, and step down into the street if necessary. If baskets or bundles are brought into the car care should be taken not to let them annoy passengers.

Etiquette of Business.

Never forget that time is precious to some persons, though you may be ready to waste it; also that money is necessary, and that it is every one's duty to settle all debts as promptly as possible.

Never fail to have all the details of an agreement decided so far as they can be before the transaction is concluded, and bear in mind that a contract can be broken only by the consent of all the parties concerned.

Never keep washer-women, seamstresses, nor any one dependent upon daily labor waiting for payment, and, on the other hand, when requesting payment of a debt, avoid any unpleasantness of tone or manner.

Never buy on credit, if cash can be had. This is a rule of common sense and practical economy.

Never forget that a character for fair dealing is a capital that cannot be lost. Do not think it unnecessary to learn the minutest details of any business, nor imagine that success in any business can be attained without a thorough training for it.

Never fail to be courteous in all business intercourse; a pleasant manner will do much to insure success.

Never insist on entering any business office, if told that its occupant is not at leisure. Courtesy requires that you should quietly await his leisure, or offer to call again if time will not permit you to wait.

Etiquette of the Club.

Doubtless, while there are few members of clubs who do not have a sufficient knowledge of the rules of etiquette governing them, some may desire information on certain points, and it is for the benefit of the latter that the following brief directions are given:

All members should become familiar with the regulations and rigidly obey them.

You have a full right to vote against the admission to a small social club of any one whose society is not agreeable to you. It would destroy the pleasure of such a club if all its members were not congenial. Yet you should not allow personal prejudice to influence you in voting upon the admission of a new member of a large club. Is the gentleman's record clear, and is he in all respects a worthy associate for gentlemen? This is the only question to be asked.

Never persistently propose for membership of a small club a name that has been refused. Avoid any conduct likely to be disagreeable or disobliging to fellow-members. A gentleman should be as courteous in a club-house as he would be in his own.

Do not talk loudly in reading-rooms or library, and never misuse books, newspapers, nor other club property.

It is selfish and impolite to monopolize the best arm-chair, to make a practice of dining early to secure an extra share of a favorite dish, or to require special attention from waiters to the discomfort of other guests.

Avoid showing anger in political or religious discussions, or making a personal matter of an argument. Do not seek to force your opinions on others against their will.

Never mention the names of ladies in the club, or show idle curiosity about other members.

Never send an employee out of the club-house on any private errand without first requesting permission of the clerk or superintendent.

If the guest of a club, do not take the liberty of introducing any one else; but the guest of a club is expected to avail himself of all the privileges of its members.

When a gentleman is admitted to the privileges of a club through the courtesy of a member, he is expected, when his temporary membership ceases, to pay any debts he may have incurred, for if he omits to do this his club-host is obliged to settle his account for him.

Etiquette of Traveling.

Ladies should wear neat traveling dresses of suitable material and simple style, display as little jewelry as possible, and

carry the smallest amount of baggage by hand. It is important to have the initials or full name on all trunks.

Never attract attention by loud talking or laughing, and, if under the escort of a gentleman, do not annoy him with needless requests. Always repay a gentleman any traveling expenses, no matter how trivial.

A lady when traveling alone, should, if possible, arrange to be met at the station by some friend. In arriving at a station in a large city where she is a stranger, she should avoid taking a hack, choosing instead horse-cars, or the stages plying between stations.

While always acknowledging with thanks any courtesy offered, young ladies should avoid entering into unnecessary conversation with or accepting favors from men who are strangers.

Older ladies are privileged to offer advice or assistance, should occasion require, to young ladies traveling alone.

It is courteous for a gentleman to offer to buy tickets, and check the baggage of a lady who is traveling under his care; but he should first take her to the ladies' waiting-room, not leave her standing on a crowded platform. He may also offer to get her refreshments, newspapers, or books, and—if the journey is a long one—invite her to walk up and down the platform at the stations. If, by any accident, the friends expected fail to meet a lady at the station, the gentleman escorting her should, if possible, go with her to her destination.

A gentleman may offer to help a lady, even if she is a stranger, whenever she seems really in need of aid. For instance, if she is laden with many parcels, or has several children with her who must be transferred from boat to car, or station to station.

Two gentlemen, strangers to each other, may talk together if agreeable to both; but it is wise to discuss only general topics.

Gentlemen may offer to open or shut a window for ladies; but should never presume upon a chance civility thus extended, by attempting to use it as a means of entering into conversation with them. While not regarded by all persons as obligatory, it is always courteous for a gentleman to offer his seat to a lady who is standing in any public conveyance.

No gentleman should smoke in cars or other places when ladies are present, spit on the floors in cars or stations, be disobliging in a smoking-car by refusing to change his seat to accommodate a party who may desire to play some game, or accept a light, or any trifling civility, from a fellow passenger, without any expression of thanks.

Before entering boat, train, or car, give the passengers who are in the act of leaving time to get off. Before taking a seat just vacated wait a sufficient time to see if its former occupant intends to return.

It is ill-bred to complain about the trivial discomforts that fall to every traveler's lot, and make uncomplimentary comparisons between one's own home and the place where one happens to be.

Never occupy more than one seat in crowded conveyances, and if you have placed a parcel on a empty seat, cheerfully remove it whenever it is needed. Do not take the seat beside any person in a steam-car without asking if it is engaged.

Never incommode fellow-travelers by opening a window which forces them to sit in a draught—it may be an affair of life and death to delicate persons.

Table Etiquette for Children.

It may not be out of place to add here a few good old rules for children's behavior at table which can safely be followed:

Give the child a seat that shall be strictly its own.

Teach it to take its seat quietly.

To use its napkin properly.

To wait patiently to be served.

To answer promptly.

To say "thank you."

If asked to leave the table for a forgotten article, or for any purpose, to do so at once.

Never to interrupt and never to contradict.

Never to make remarks about the food.

Teach the child to keep his plate in order.

Not to handle the bread nor to drop food on the cloth and floor.

To always say "excuse me, please," to the mother when at home, and to the lady

or hostess when visiting, if leaving the table before the rest of the party.

To fold its napkin and to put back its chair or push it close to the table before leaving.

And after leaving the table not to return.

Children who observe every one of these rules are well-behaved, delightful companions, and owe it to their mothers's careful training.

XI. FORMS OF INVITATIONS

XI. Forms of Invitations.

In issuing invitations for any occasion, they should be sent out as nearly as possible together, and in ample season. If they be for a large reception, dinner, or similar entertainment it is best to send them a week or two in advance; and for a ball, in the height of the season, two or three weeks. No one should be invited at the last moment, except it be an intimate friend, who can be trusted to excuse lack of ceremony.

For large or formal occasions, such as dinners, balls and receptions, use plain cards, or note-paper, engraved in plain script. If the invitations be written, small white note-paper, of the best quality, should be used, and the writing done carefully, with proper attention to the arrangement of words.

Invitations to Parties.

The following will serve as a correct form for a note of invitation to a private party:

Mrs. William H. Johnson
requests the pleasure of
Mr. and Mrs. James Browns' company
On Thursday evening, April eighth,
from nine to twelve o'clock.

As an example of a suitable reply we give the following:

Mr. and Mrs. James Brown have much pleasure in accepting Mrs. William H. Johnson's kind invitation for Thursday evening, April eighth.

Or, if circumstances render it necessary to decline, the cause of declination should be courteously stated, as follows:

Mr. and Mrs. James Brown regret that a previous engagement to dine with Mrs. Rowland deprives them of the pleasure of accepting Mrs. William Johnson's kind invitation for Thursday evening, April eighth.

The reasons for declining may be very varied, but should be distinctly stated. "A previous engagement" has often to do duty in this case.

A prompt reply must invariably be made by all who recognize the obligations of courtesy, and it may be well to give one or two examples of an uncivil manner of replying, into which well-meaning persons sometimes fall through ignorance or carelessness:

Mr. and Mrs. Brown regret that they cannot accept Mrs. William H. Johnson's invitation for Friday evening.

A still ruder form is: *Mr. and Mrs. Brown decline Mrs. Johnson's invitation for Friday evening.*

It needs little knowledge of the laws of etiquette, however, to teach people not to commit such glaring incivilities as the latter.

A simple form of invitation to an evening party is the following:

Thursday, May seventh.

Mrs. —— requests the pleasure of Mr. ——'s company at an Evening Party, Thursday, May twenty-eighth.

An answer will oblige.

Dancing. [Music, or any special attraction].

The answer, which should be returned within a day or two, may be similarly brief:

Mr. —— has much pleasure in accepting Mrs. ——'s polite invitation for Thursday evening, the twenty-eighth.

Saturday, May ninth.

Short or verbal invitations should never be given, even among relations and intimate friends. These are discourteous, as implying that the persons invited are of no importance.

Dinner Invitations.

Dinner invitations are written or engraved in the name of both husband and wife:

Mr. and Mrs. Henry Wilson
request the pleasure of
Mr. and Mrs. Samuel Clayton's company at dinner
November eighth, at seven o'clock.

An acceptance should be worded as follows:

Mr. and Mrs. Samuel Clayton
accept, with pleasure,
Mr. and Mrs. Henry Wilson's kind invitation to dine with them,
on Monday, November eighth, at seven o'clock.

An invitation to dinner, once accepted, should be held as little less than a sacred obligation. Only disabling sickness or other extreme necessity should be permitted to stand in the way of its being kept; and then, if time permits, immediate notice, with reason for same, should be given. A dinner party is carefully arranged for a set number, and one or more empty chairs are sure to disturb the completeness of the occasion, and cause heartburnings to host and hostess. A late invitation to fill the gap is usually sent, with proper explanation, to some friend who may be depended upon to overlook the informality.

Invitations should be issued in the name of the hostess, except those to weddings and dinner parties.

R. S. V. P., the initials of the French phrase "*Respondez, s'il vous plait,*" or "Please reply," may be written in the right-hand lower corner of an invitation if an answer is particularly needed. Its use, however, is becoming less frequent, since it tacitly implies that the recipient needs a reminder. In a dinner invitation it is especially unnecessary, since nothing can be more discourteous than to fail in an immediate answer. The day and hour named should be repeated in the answer, to avoid possible misunderstanding. If guests are asked to meet a distinguished gentleman, or lady, this should be mentioned in the card of invitation, directly after the hour of dinner; for instance:

At seven o'clock, to meet
Mr. John P. Wallace,
of London.

Or an extra card may be inserted with the regular invitation, saying, "to meet Mr.—," etc.

Here is an example of an invitation to a reception specially designed for this purpose:

Mr. and Mrs. Thomas F. Jackson
request the honor of your presence
on
Tuesday evening, November fifteenth,
from eight until eleven o'clock,
to meet the
Rev. Professor Patton
of the
University of Pennsylvania,
R. S. V. P. *119 Locust Avenue.*

Invitations to large entertainments, receptions, etc., may be sent to persons in mourning if the bereavement has not occurred within a month; but etiquette permits them to refuse without assigning a reason, sending, however, on the day of the entertainment, black-bordered visiting-cards, which announce the cause of their absence. Invitations to dinners and luncheons should never be given to persons in recent affliction.

Always direct an answer to an invitation to the person or persons who issue it, even though they may be strangers to you. Always answer an invitation to dinner or luncheon at *once*, accepting or refusing positively. The reason is obvious; the number of seats being limited, a prompt reply gives the entertainer an opportunity to supply your place. Should illness, a death in the family, or any other reason prevent the keeping of a dinner engagement, a letter or telegram should be immediately sent, stating the fact. All invitations, in fact, should be answered with as little delay as possible.

When issuing invitations to a family, direct one to the husband and wife, one to the daughters, and one to the sons. The daughters' names may be placed after the parents on the same card, but not the sons.

Notes of invitation to a gentleman should be addressed Mr. A. B. Cohen, *never* A. B. Cohen, Esq. Gentlemen must never be invited without their wives, nor ladies without their husbands, unless to entertainments given exclusively to gentlemen or to ladies.

Small Entertainments.

Visiting-cards must not be used either to accept invitations or to regret the necessity of declining them, though invitations to small entertainments may with propriety be written on a lady's visiting-card.

A less formal mode of invitation to an evening reception may be the following:

MRS. SMITH,
At Home,
Tuesday, May ninth, at nine o'clock, 849 Green Street.

If dancing, music, or other entertainment is provided, it can be mentioned in a word at the bottom of the invitation.

We append below an invitation to a musical and card party, with acceptance of same:

Hilton, January 1, 1902.

DEAR MRS. NUTTALL:

We purpose having a small party for music and cards next Thursday, and hope that you, your husband, and the dear girls will join us. If you can favor us with your company, please ask the young ladies to bring their violins and music, and do not be later than eight o'clock.

We unite in kindest love to you all.

Believe me, most affectionately yours,
Lois Markley.

ACCEPTING.

MY DEAR MRS. MARKLEY:

We shall have much pleasure in accepting your kind invitation for Thursday next. Edith desires me to give you her love, and to say that she is delighted at the prospect of a musical evening; she will bring all your favorite selections, and do her best to play them. With our united regards, believe me,
yours affectionately,
SUSANA NUTTALL.

"The Willows,"
January twelfth, 1902.

Where there are several sisters in a family, addressed on an invitation as "The Misses ——," it is usually understood that not more than two of them will avail themselves of the invitation.

Invitations for any general entertainment sent to a country house where guests are stopping, are, as a rule, addressed to "Mr. and Mrs. ——, and party," this invitation being expected to include the sons and daughters of the family as well as the visitors.

Form of English Invitations.

The following is the style often used in England for invitations to garden parties, etc.:

MR. AND MRS. JONES
request the pleasure of
MR. AND MRS. ROBINSON'S
company at a garden party on Tuesday, June ninth, at four o'clock.
Collation at seven o'clock.
Dancing 8 to 11.
10 Corson Place. *R. S. V. P.*

For afternoon teas, etc., the visiting-card of the hostess, with simply "Tea at four o'clock," and the date in the left-hand corner, is all that is necessary, or possibly "At home from four until seven."

Wedding Invitations.

Invitations to marriage ceremonies are issued in the name of the bride's parents, or, if both are dead, in the name of a near relative or guardian. Paper without crest or monogram is considered the best to use so far as good taste is concerned. The accepted form is as follows:

MR. AND MRS. ROBINSON
request the pleasure (or honor) of your company at the marriage of their daughter
MARY BURD
to
MR. JAMES HOWARD WILSON,
at St. James' Church, on Tuesday, June tenth, at twelve o'clock.

Separate cards are sent if the wedding ceremony is to be followed by a reception at the parents' residence, the formula used being "Mr. and Mrs. Smith at home, etc."

To avoid confusion at the church a small card is sometimes enclosed with the invitation, on which the name of the church and the hour for the ceremony are printed. Such cards must be presented at the door, in order that, to avoid a crowd, only such friends as have received invitations to the wedding may be comfortably seated.

In case no reception is given, and the newly-married couple wish to announce to their friends their new abode, a card in the following form may accompany the invitation:

AT HOME
Tuesdays in May.
489 Green Street
Philadelphia.

In the case of house weddings, or when recent bereavements demand that the wedding shall be private, it is now customary to invite intimate friends by written invitations, and send simple announcements of the event to those not expected to be present. In such cases the stationery used should be of the same quality and style as for the invitations. The announcement may read as follows:

Mr. and Mrs. Harvey Wellington
Announce the Marriage
of their Daughter
Catharine
to
Mr. James Howard,
Saturday, September ninth.
Philadelphia,
1902.

An invitation to an anniversary wedding may be couched in the following form. If no presents are desired, the invitation should explicitly say so, otherwise it will be taken for granted that they will be acceptable:

1877 *1902*
Mr. and Mrs. Andrew Lewis
request your presence
at the
Twenty-fifth Anniversary of their Wedding
Wednesday Evening, March eighth,
194 Lombard Avenue,
New York.
No presents.

General Invitations.

In addition to the forms of invitation to more or less formal occasions above given, notes inviting to various informal meetings may take forms familiar or the reverse, in accordance with the degree of intimacy of the parties. A few forms will suffice as examples:

New York, June 8, 1902.
My dear Mr. Wilson:
A few of us are arranging for an excursion to Bolton Springs on the 15th inst. We should be very glad to have you as one of the party. We shall be three days absent from town. If you can make it convenient to accompany us, we are sure you can count on an enjoyable time. Be kind enough to let me know within a day or two, and believe me
Sincerely yours,
A. B.

10 Brown Street,
New York, December 18, 1901.
Dear Mr. Wilson:
Can you make it convenient to run over to New York on Christmas day, and drop in on our small family party? You can count on a hearty welcome, and a fair allowance of the enjoyments of the season.
Yours very truly,
Henry Smith.

As examples of more familiar notes of invitation, between intimate friends, the following will suffice:

Dear Harry:
Some of us are expecting to spend a few hours jovially, next Wednesday evening with a glass of wine and a cigar as enliveners. I hope you will make one of the party, and shall hold a chair for you.
Yours as ever
Will.

Dear John:
Our old friend Harvey Wilson has just got home from his Western trip. I have asked him and his cousin James to take a chop with me to-morrow at six p. m., and want you as a good fourth. Don't fail me. You know what a good fellow Wilson is.
Yours faithfully,
H. P. Jones.

HOME DECORATIONS

A Window Garden. Showing a happy arrangement for keeping plants in a south window. In the centre is a wire stand below which are window shelves. The plants arranged to get the sunlight to the varieties needing it most.

HOME DECORATIONS

The Ingle Nook and Mantel. A suggestion for beautifying a room where there is a fire place and mantel and space at each side for artistic seats and cushions. The whole effect is that of warmth and comfort. A few choice ornaments are on the mantel, handy volumes on the shelves and pictures on the wall.

My Dear Mary:

A few friends will be with us on Friday evening, the 8th inst., to share a social cup of tea and have an hour's chat. Can we count on the pleasure of your company?

J. S. White.

My Dear Jennie:

Your kind request is at hand. I shall be glad to accept it, and hope to enjoy both the tea and the chat.

Yours cordially,
Mary Moore.

My Dear Sir:

We start next Tuesday for the Catskills, by private conveyance. There is room for one more in our carriage, and we should be glad to have you fill the vacant space. I trust no inconvenient engagement will hinder your acceptance.

Yours socially,
William Black.

Mr. S. D. Henderson.

Invitation to a Carriage Ride.

Hillsdale, Ohio, October 3, 1901.

My dear Miss Barry:

In these bracing Autumn days, when the foliage is so beautiful, I am sure you will enjoy a ride for an hour or more. It will give me great pleasure to have your company for a ride on Saturday afternoon next, and I hope you will have no previous engagement at that time.

Sincerely yours,
Francis Thorne.

Reply of Lady to Invitation.

"The Cedars."

Dear Mr. Thorne:

It is, indeed, very kind of you to think of my pleasure. The prospect of a ride for Saturday afternoon is very attractive.

I shall be pleased to go with you, and shall await you at three o'clock Saturday.

Sincerely,
Bertha Barry.

October fourth, 1901.

XII. ART OF LETTER-WRITING

A correspondence between two persons is simply a conversation reduced to writing. We should write to an absent person as we would speak to the same party if present. To a superior, we ought to be respectful; to a parent, dutiful and affectionate; to a friend, frank and easy; and clear and definite in our expressions to all.

Conciseness is one of the charms of letter-writing. A letter should contain the desired facts, ideas, and feelings; but they ought to be expressed as briefly as perspicuity and elegance will permit.

Lengthened periods are as much out of place in a letter as they would be in conversation, for they tire the reader even more than they would the hearer. When written, their faults are also perceived with much less difficulty than when spoken.

When the party to whom a letter is addressed is uninterested in the subject on which it is written, the writer of it should display a brevity which will attract attention and insure a perusal. No unnecessary ornament should be used, nor, in fact, anything introduced but what is important and bears strongly on the case stated, or the inquiry made.

To an absent friend, on the contrary, a lengthy epistle, well filled with details of passing incidents, is likely to prove welcome and interesting, and one may venture even upon prolixity if sure that his correspondent has a strong interest in the subject, and is likely to desire minute details concerning it.

Style in Correspondence.

The style of the letter may rise with the subject, and with the character of the person written to. In a familiar epistle an effort at dignity of style is misplaced, but such is not the case where the person addressed is superior in position or character, or where the subject is one demanding seriousness and dignity. For instance, the death of a friend or relation, a calamity, or any circumstance of grave importance, should not be communicated in the same manner as a trifling occurrence, or even a happy event:

brevity, in the latter case, is beauty; in the former, it would be deemed unfeeling and abrupt.

Express your thoughts in simple English and in legible writing. The latter should be clear and bold. Never write carelessly or hurriedly; read the letter over before sending; and, if writing more than one letter at a time, be cautious that such are not put in the wrong envelopes. Great attention should be paid to correct punctuation.

As to writing material, the shape and size of paper and envelopes are not so important as the quality. They should be plain white, with no colored border (except the black border when in mourning), and of substantial texture. The address of the writer, printed neatly at the head of the sheet, should take the place of any attempt at ornament.

Fold all letters evenly, and put the stamp in the upper right-hand corner. Remember to enclose a stamp when writing to a stranger concerning your own affairs. Use postal cards only for ordinary business communications; never for friendly correspondence or in writing to any one who might be annoyed by having his or her occupation made public.

Take the trouble to spell correctly. Be careful to write dates, numbers and proper names plainly. Date a note, at the conclusion, on the left-hand side of the page; a letter at the beginning, on the right hand. Sign a letter with a full name, or with the last name and initials. In business correspondence sign "yours respectfully," "your obedient servant," "yours truly," or "yours sincerely." Place the name and address of your correspondent at the upper left-hand corner of the page.

Let your signature suit the style of the letter—a business communication should bear a formal, a friendly note, a cordial conclusion. Between intimate friends and relatives no formal rule is laid down for the beginning and ending of letters. The etiquette of letter-writing should only be considered between strangers or slight acquaintances. In these cases it is well to preserve a mean between cold formality and familiarity.

Forms of Address.

The conventional forms are "Sir," "Dear Sir," "My Dear Sir," or "Madam," "Dear Madam," or "My Dear Madam." Either of these can be used, but to a total stranger "My Dear Sir" is rather too cordial, and to an acquaintance "Sir" is too formal, unless there is a purpose to convey coldness of feeling. When writing to persons of your own social class, though strangers, "Dear Sir" or "Dear Madam" are used in preference to "Sir" or "Madam."

A married lady should not sign herself "Mrs.", nor an unmarried one "Miss," except in writing to a stranger who will need to reply. In this case the full name should be signed, as "Miss Susan Blake," or "Mrs. Mary Brown." Mrs. and Miss may be enclosed in parenthesis. Letters to married ladies are usually addressed with the initials or names of the husband, "Mrs. John P. Smith," etc. Widows and unmarried ladies should only be addressed with their christian names, "Mrs. Mary Smith" or "Miss Fanny Jones." The eldest daughter or unmarried lady of the family should be addressed "Miss" simply, the christian name being omitted. "Mr." and "Esq." cannot be used simultaneously. A letter must be addressed either like the following examples, to "Mr. R. H. Smith" or to "R. H. Smith, Esq." When a letter is addressed to the Hon. James Blank, the "Esq." must not follow.

Never use the husband's title in directing a letter to the wife, as "Mrs. Gen. James Bancroft," or "Mrs. Rev. John Pearl."

Do not cross a letter, put the most important part of it in a postscript, or sign it in the first person, if it has been written in the third. Never fail to answer promptly, in case the communication requires an answer.

When a note is commenced "Sir" or "Dear Sir," it is usual to write the name of the person addressed at the end of the letter or note in the left-hand corner, or it may be put before the commencement; for instance, "To R. H. Smith, Esq.," but in this case it must not be repeated at the bottom.

A son of the same name as his father is addressed in this way: "R. H. Smith, Jr., Esq."

Letters or notes to servants usually begin with the servant's name, and then the directions follow in the third person; example: "To Mary Smith: Mrs. Brown will return home on Saturday next, etc."

Address a clergyman "Reverend Sir" or "Dear Sir," and direct the envelope to "Rev. John Blank;" or if the initial is not known, to "Rev. —— Blank."

Address a doctor of divinity "To the Rev. John Hall, D.D.," or the "Rev. Dr. Hall."

Address a doctor of medicine "J. B. Blank, M.D.," or "Dr. J. B. Blank," or "Dr. Blank."

Address a bishop "To the Right Rev. the Bishop of ——," or "To the Right Rev. H. C. Potter, D.D., Bishop of ——," and begin the letter "Right Rev. Sir," or "Right Rev. and Dear Sir."

Address foreign ministers as "His Excellency and Honorable."

Letters to the President should be addressed "To His Excellency, the President of the United States," or "President of the United States."

Cabinet officers should be addressed "To the Honorable J. C. Blank, Secretary of State," "To the Hon. ——, the Postmaster-General," etc.

In writing to Senators or members of the House, address "To the Hon. ———."

Officers of the army or navy are addressed by their titles, as "General Wilson Earle," "Captain Paul Jones," Admiral William Harvey," etc. The members of a college faculty are addressed as "Professor," and their particular title may be added after the name, as "D.D.", "LL.D," etc. This addition of titular abbreviations applies as well to scientists, physicians, and all others whose special college title may be known to the writer.

Letters of Recommendation.

A letter of recommendation should be composed with careful attention to its statements. It is a guarantee for the party recommended, and truth should never be sacrificed to condescension, false kindness or politeness. To write a letter of recommendation contrary to one's own opinion and knowledge of the person recommended, is to be guilty of a great imprudence.

To say all that is necessary, in a clear and distinct manner, and nothing more, is the grand merit of a letter on business of any kind. Pleasantry and pathos would be greatly misplaced in it, unless it embraced some other subject than the business one. Brilliant diction is a dress in which directions on business should never be clothed. The style ought to be precise, sufficiently copious to leave no uncertainty, but not redundant. Every thing necessary should be stated, plainly and unequivocally; so that the party addressed may be in full possession of our desires and opinions on the subject involved. Ambiguity is nowhere so unpardonable as in a letter on business.

Letters of Introduction.

Letters of introduction are one of the common methods of establishing social relations. The person who is not known to your friend can become known through your kind offices. In this way, very often, important services can be rendered.

Never give a letter of introduction unless you thoroughly understand the character and manners of the person to whom you write the letter and also of the person whom the letter introduces.

You have no right, to avoid giving offence, or through sheer inability to say no to a request, to foist upon your distant friend some one for whose acquaintance he will not thank you and who may prove a very undesirable visitor. If one or the other of the two parties concerned must be offended, let it be the applicant. You can usually give some sufficient reason for declining—but decline in any event, if the person is likely to prove objectionable.

As such a letter cannot well enter into particulars, it is customary and desirable to notify your friend by mail of the fact that you have given a letter of introduction to such a person, and tell him what further it is well for him to know concerning the character and purpose of his probable visitor. If you have given such a letter to a party of whom you do not approve, all that

remains is to warn your friend privately, placing him on his guard against a possibly objectionable person.

A letter of introduction (unless sent by mail) should be delivered, unsealed, by the writer of the letter to the bearer of the introduction, and should be closed by the latter before delivery to the party to whom it is addressed. If purely a business introduction and one which can be delivered personally, it may remain unsealed.

The bearer of a letter of introduction should send it to the house of the person to whom it is addressed, together with a card on which should be written his address. It is not in order to deliver it in person, since this may force the party addressed into a position which he may prefer to decline. It does not follow, because a friend has chosen to introduce you to another, that this other may not have private reasons for declining your acquaintance, or may be prevented from seeing and entertaining you by stress of other engagements. If he lives in a large city, the letter may make him feel obliged to escort you to the various places of interest, or in any case to invite you to meals or other entertainments. We should not tax the time or the purse of a friend, except for a satisfactory reason.

The letter delivered, there is nothing more to be done until the party receiving it calls upon you or sends you some card or note of invitation. Those who receive such letters should, within twenty-four hours, if possible, take some kindly notice of them by a call or an invitation.

A letter of introduction must be carefully worded, stating clearly the name of the person introduced, but with as few personal remarks as possible. It suffices in most cases to say that the bearer is a friend of yours, whom you trust your other friend will receive with attention, or you may state his profession, object in traveling, etc. In traveling, one cannot have too many letters of introduction. It is the custom in foreign towns for the newcomer to call on the residents first, a hint that may prove acceptable to persons contemplating a long or short residence abroad.

A letter of introduction of a business nature may be delivered by the bearer in person, since it requires no social obligations. In style it should resemble other business letters; that is, it should be brief and to the point.

If a stranger sends you a letter of introduction, and his or her card (for the law of etiquette here holds good for both sexes), good form requires that you should not only call next day, but follow up that attention by others. If you are in a position to do so, the next correct proceeding is to send an invitation to dinner. Should circumstances not render this available, you can probably escort the stranger to some exhibition, concert, public building, museum, or other place likely to prove interesting to a foreigner or provincial visitor. In short, etiquette demands that you shall exert yourself to show kindness in some desirable way to the stranger, out of compliment to the friend who introduced him to you.

If you invite strangers to dinner or tea, it is a higher compliment to ask others to meet them than to dine with them alone. You thereby afford them an opportunity of making other acquaintances, and are assisting your friend in still further promoting the purpose for which he gave the introduction to yourself. Be careful at the same time only to ask such persons as you are quite sure are the stranger's own social equals.

Letters of Congratulation or Condolence.

Epistles of this kind need to be very carefully written. Unless there is some actual sympathy in the mind of the writer, they had better, in many cases, be left unwritten, since they may serve the opposite purpose to that designed. A verbal expression of feeling, where there is no feeling, is apt to fail of its intention. If such a letter prove difficult to compose, it is likely to seem studied, cold, and formal. Simplicity and ease of expression are necessary elements in a note of condolence or compliment.

A letter of congratulation should avoid any indication of other than unselfish good feeling in the writer. The slightest show of envy or jealousy at the good fortune of those whom we felicitate is unpardonable. It should on no account contain a hint of any

hope that the advancement, or change of situation, upon which the compliment is made, may afford the person addressed the means of conferring a benefit on the party writing.

Such a letter should, in fact, be an unmixed expression of pleasure and congratulation on the event that calls for its production. But care must be taken to keep within due bounds; to exaggerate in our congratulations may be to seem satirical.

In a letter of congratulation we should be cheerful; from an epistle of condolence all pleasantry should be banished. When addressing a person who is laboring under any grievous calamity, it is bad taste to make light of it; to treat that loss as a matter which might be endured calmly, by a little firmness on the part of the party who has suffered it, has the effect to irritate rather than soothe. One should seek to enter into the feelings of the mourner, to eulogize the departed relation, to rebuke the ingratitude of the false friend, to confess, the inconstancy of fortune, or otherwise, according to the circumstances; and, without magnifying, to lament the affliction.

Language like this is balm to the wounded mind, which rejects consolation from those who do not seem sensible of the extent of the sorrow under which it labors. But such a subject must be treated with a delicate hand, for an exaggerated expression of sympathy may give the appearance of insincerity, and of a strained endeavor to condole. In such a case it may aggravate the depression which it seeks to remove.

Replying to Letters.

Every letter, that is not insulting, merits a reply, if it be required or necessary. If the letter contains a request, it should either be acceded to gracefully and without ostentation, or refused without harshness. An answer to a letter of condolence or of congratulation should be grateful. The subjects should succeed each other in proper order, and the questions put be consecutively answered. In familiar correspondence a greater latitude of arrangement is allowed; but even in this no question should be left unanswered. In all replies it is usual to acknowledge the receipt, and to mention the date, of the last letter received: if this be neglected, your correspondent may be left in doubt, and may, through misunderstanding, hold you guilty of some offense.

Punctuation.

Punctuation is a matter of the utmost importance in every species of literary composition; without it there can be no clearness, strength, or accuracy. Its utility consists in separating the different portions of what is written in such a manner that the subjects may be properly classed and subdivided, so as to convey the precise meaning of the writer to the reader. It shows the relation which the various parts bear to each other, unites such as ought to be connected, and keeps apart such as have no mutual dependence.

It is much to be lamented that so little attention is paid to this important subject. As there is no positive system of punctuation to direct the writer, the modern editions of good authors should be carefully studied, in order to acquire the leading principles of the art. The construction of sentences may be examined, and the mode adopted of dividing them attended to with considerable advantage.

One cannot expect, perhaps, in this manner to become an expert in punctuation, but may grow sufficiently familiar with its essential elements to make no serious errors. The mode of placing punctuation marks permits of considerable latitude, and it is advisable not to be too profuse in their employment. The use of the comma is frequently very faulty through carelessness in this particular, dividing parts of sentences which naturally cohere, and being dropped in the centre of a phrase in which it is absurdly out of place. The natural halting points for the reader, or slight breaks in the sense, should be duly considered, and a mark placed in consonance with the degree of this break. The comma and the dash do duty with many as the only elements of punctuation, the latter being much over used, through a desire to escape the necessity of considering the proper mark required.

Postscripts.

Lady writers have been accused, and perhaps with some reason, of often reserving the most important part of a letter for the postscript. It is an accusation which they should avoid giving cause for. Postscripts are, for the most part, needless, and in bad taste. It is best to pause a few moments before concluding a letter, and reflect whether we have anything more to say. Above all things, none should defer civilities or kind inquiries to this justly-despised part of a letter. To do so is a proof of thoughtlessness or disrespect. "My kindest regards to my cousin Lucy," added as a postscript, looks like what it really is—an after-thought; and is, therefore, not only without value, but, to persons of fine feelings, offensive.

To all writers something will occasionally occur, after finishing the letter, which it is important to state. If to have forgotten it implies no disrespect it may properly be added as a postscript. But if it should indicate a forgetfulness which may possibly offend the recipient, the whole letter had better be rewritten, and the after-thought put in its proper place.

XIII. FORMS OF CORRESPONDENCE.

Having given in the preceding sections some hints as to letter-writing and examples of notes of invitation, acceptance, and declination, it seems important to append some more diversified examples of letter-writing and correspondence, as brief guides to a broad domain of social duty and obligation. Letters of this kind are endlessly diversified in form and purpose, and a few examples, chosen largely at random, must suffice.

Ordering Goods.

In ordering goods be careful to state exactly what you want, and whether you wish goods delivered by freight or express.

It is customary in writing orders to use abbreviations for mercantile terms which are known among business men.

Should you wish to ask any questions or to make suggestions, write these upon a separate sheet from the order itself.

Send your order some time before you need the goods, so that you may not suffer on account of any slight delay upon the sender's part.

Danville, Va., Dec. 20, 1903.
Strawbridge & Clothier,
Philadelphia, Pa.
Dear Sirs:

Enclosed find draft for $75 on First National Bank of Danville, for which please forward by U. S. Express:

6 pairs White Kid Gloves, No. 6.
3 pairs Brown Kid Gloves, No. 6.
1 dozen Linen Handkerchiefs lady's size.
15 yards of Silk like sample enclosed.

The amount overpaid in my remittance you may place to my credit subject to future orders.

Respectfully,
(Mrs.) Julia D. Brown.

Application for a Situation as Teacher.

Salina, Kansas, July 5, 1902.
Gentlemen:

Understanding that a vacancy for the situation of teacher in your school has occurred, I beg to offer myself as a candidate, and to inclose my certificate and letters of recommendation from persons you no doubt know. While I feel that these can better speak for me than I can for myself, I venture to assure you that, should you appoint me to the position, I shall strive to discharge my duties earnestly and steadily, and shall ever remain,

Your grateful and obedient servant,
Jeanette Wilson.
To the Trustees or Principal of School.

Introducing a Young Lady Seeking Employment.

Brooklyn, May 2, 1903.
Dear Mr. Martin:

This will introduce to you my friend Miss Mabel Beechem, who is desirous of obtaining employment in your city. I use our old acquaintanceship to interest you in her behalf. She has received a very liberal education, and would prove of great value to a family whose

young children need careful and judicious teaching. She is gentle, amiable, and willing. I trust you will be able to serve her, and I shall greatly appreciate the attention you may give her.

Very truly,
Barclay Jones.

To Mr. Joseph Martin,
2175 Pine Street Philadelphia, Pa.

Introducing a Friend.

St. Louis, Mo., Jan. 3, 1901.

Dear James B.:

This letter will introduce to you my dear friend William White, who is to be in your city for a few days on business and pleasure. I desire him to meet you and trust it will be convenient for you to give him a few moments of your time.

Any attention you give him during his stay in Chicago will be greatly appreciated by

Your friend,
Charles F. Jenkins.

Mr. James B. Smith,
141 Wabash Avenue, Chicago.

Short Form of Introduction.

Chicago, Ill., June 11, 1900.

My Dear Sir:

I have the honor of introducing to your acquaintance Mr. Frank Ward, whom I commend to your kind attention.

Very truly yours,
William S. French.

Mr. Benj. F. Strong,
Detroit, Mich.

Congratulating a Gentleman Upon His Marriage.

Wilmington, Ohio, Sept. 12, 1900.

Dear Frank:

I have just received the welcome message informing me of your new happiness. I hasten to offer you my most sincere congratulations and hearty good wishes. May every year of your married life find you happier than the last, and may Mrs. Cranston find you as loyal a husband as you have been a friend.

From my inmost heart, dear Frank, I say, God bless you and your bride with His choicest blessings.

Ever your friend,
George Maris.

Mr. Frank Cranston,
Newport, Del.

Congratulating a Lady Upon Her Marriage.

179 D St., N. W.
Washington, D. C., Nov. 4, 1903

Dear Emma:

Your cards have just reached me, and I write at once to try to express my heartfelt pleasure at your happy prospects. It is a great pleasure to your loving friends to be able to feel so much esteem and affection for the gentleman to whom you have confided your life's happiness, and to hope, as I do, that every year will unite your hearts more closely.

That Heaven may bless you both, dear Emma, is the earnest prayer of

Your loving
Laura Shipley.

Mrs. J. Barrie Brown.

A Letter Sent with a Gift (a Book).

977 President St.,
Brooklyn N, Y., Dec. 20, 190–.

My Dear Friend:—I hope the accompanying volume, of which I ask your acceptance as a slight token of my regard, will suit your taste. Books are in themselves friends, and are therefore, I think, the most appropriate souvenirs of friendship. In fact the current phrase, "I know you like a book," although a vulgarism, seems to imply the same intimate relation between reader and author that should exist between friend and friend. Please apprise me of the receipt of the package, and believe me,

Ever yours sincerely
John Clark.

To Miss Julia Thomas, Brandywine, Del.

The Reply.

Brandywine, Del., Dec. 23, 190–.

My Dear Mr. Clark:—Accept my thanks for your handsome present. You could not

have selected a book that would have pleased me better. I think with you that books (of the right kind) should be looked upon as agreeable and useful friends; but nevertheless the friend whom neither time nor distance can estrange, is a treasure of more value than all the volumes that ever were printed. Permit me to regard you in that light, and again thanking you for your present, to remain,

Sincerely yours,
Julia Thomas.

To Mr. John Clark, Brooklyn, N. Y.

Soliciting a Loan from a Friend.

2790 N. Broad St.,
Philadelphia, Sept. 9, 1903.

My Dear Sir:—A disappointment in the receipt of some money due has exposed me to a temporary embarrassment. The sum which would extricate me from this painful difficulty is not large, as $400 would be amply sufficient to release me from my present pressure. I have so great an aversion to borrowing money from professional lenders, that I prefer the course of soliciting the aid of some well-known friend. I have thought of several, but of none with a greater degree of confidence than yourself. Can you grant me, then, the accommodation of the above sum, without in any way intrenching on your own convenience? If you can, I believe I may rely on your readiness to do so; and you may in turn depend being reimbursed with the strictest punctuality by the 5th of April. A speedy reply to this request will extremely oblige,

My dear sir,
Yours most sincerely,
Joseph Howard.

To Mr. Frank Thomson.

In Answer Declining, on Account of Incapability.

1785 Mulberry Street,
Philadelphia, Sept. 10, 1903.

My Dear Sir:—I truly regret that my circumstances will not permit me to oblige a friend so dear to me as yourself; but at present I am in great need of money, and last Friday I was compelled to borrow, to meet a pressing obligation; I therefore do not have it within my power to comply with your request.

Trusting that you may be more successful in some other quarter, and with feelings of regret at my own inability to render you a service which you might otherwise readily command,

Believe me to remain,
Ever your sincere friend,
Charles Hall.

To Mr. Joseph Howard,
No. — Lexington Ave., N. Y.

A Letter to a Friend (on the Anniversary of his Birthday.

1917 Green Stree',
Philadelphia, July 3, 190–.

My Dear Walter:—Birthdays may be called the milestones in life's journey, and as you reach another of these anniversary land-marks to-day, permit me to congratulate you on having traveled them thus far in safety, and to wish you, with all my heart, many similar opportunities of receiving the good wishes of your friends. That your future years may glide happily away, without care or sorrow, is the sincere prayer of,

Yours most sincerely,
Thomas Meek.

To Mr. Walter Dewey,
Crestline, Ohio.

Reply to the Above.

Crestline, Ohio, July 10, 190–.

Dear Tom:—Congratulations that come from the heart, as I am sure yours do, are always welcome. I scarcely know, however, whether we ought to be complimented on growing older, unless we grow wiser and better as well. Nevertheless, the custom of receiving the felicitations of one's friends and acquaintances, on having made another step toward the goal, is decidedly an agreeable one, and I thank you most cordially for your kind note.

Your obliged friend,
Walter Dewey.

To Mr. Thomas Meek,
Philadelphia, Pa.

Requesting a Friend to execute a Commission.

Santiago, Cuba,
April 15, 1902.

My Dear Emma:—Will you kindly execute the following little commissions for me, as

A MODEL KITCHEN

The two views show a model kitchen arranged for convenience for health and economy. The floor covered with oil cloth or tiles, the walls papered or painted, plumbing easily accessible, pantries and cupboards ample—range of the latest pattern, and sinks with hot and cold water.

BEDROOM FURNISHINGS

The bedroom at the left is a suggestion for a room furnished in blue and white. The walls may be hung with satin striped paper. The draperies may be easily made and artistically arranged. The room at the right looks out upon a balcony. The bedstead may be of brass, the furniture of birds-eye maple, bedspread and bureau cover may be trimmed with lace. The floors may be covered with rugs, and walls tinted.

soon as you can make it convenient? Purchase for me at Macy's the following articles; — (here state ribbons, muslins, &c., as wanted.) Will you also call at Doubleday's and inquire when Bacheller's new novel will be out, as I am all anxiety to know.

Please give them my address at Macy's, and tell them to pack the parcel carefully and send it by express.

The weather down here is delightful; but I wish I had the pleasure of your company to render it more so. Pray write a line and let me know how soon you can make me a visit, and thus afford me an opportunity to thank you personally for your kindness.

Lois C. Pharnum.

To Miss Mary White,
No. — Washington Square, New York.

Application for Subscription to a Charity.

Duane Street,
Louisville, Ky.,
January 17, 190–.

Sir —I take the liberty of inclosing a prospectus of an institution which is likely to have a most beneficial effect upon the condition of the poor in our neighborhood. (Here state particulars.) On account of your well-known liberality, I trust you will excuse this appeal in furtherance of an act of benevolence, and remain,

Sir, your most obedient servant,
Harry R. Jones.

To Pliney Earle, Esq.,
No. — West 18th Street, City.

Letters of Application.

BOY WANTED for Transportation Office; must be good penman; $15 per month. Address, in own handwriting, H, 236 Ledger Office.

Philadelphia, Pa., Jan. 3, 1901.
H, 236 Ledger Office.

Sir:—I would respectfully apply for the position advertised in to-day's Ledger. I am fifteen years old, reside with my parents at 79 Jayne Street, Camden, and refer you to Mr. S. L. Thomas, 814 Market Street, this city, from whom I received the enclosed testimonial.

Very truly,
Albert Jenkins.

Application for Position of Salesman and Collector.

100 D St. N. W.
Washington, D. C.,
March 21, 1901.

Messrs. S. H. Smith & Co.,
Wheeling, W. Va.

Gentlemen:

I am recommended by Mr. Frank Stuart to apply to you for the position of salesman and collector, recently occupied by him in your warehouse.

I am twenty-eight years of age, and reside with my father in this city, who will give bonds for me if required. I have had some experience in your line of business, and should be pleased to have a trial with you, if preferable, previous to a permanent engagement. I am at liberty to refer to Messrs. W. H. Fletcher & Co., Lace Curtains, 198 Broadway, New York, also to Messrs. Simpson & Jones, Upholstery Goods, 166 Arch Street, Philadelphia, Pa.

Very respectfully,
Edward Murphy.

Requesting the Settlement of an Account.

Newark, N. J., Dec. 25, 1900.

Mr. James Jones,
Burlington, N. J.

Dear Sir:

I call your attention to the fact that your account, which I enclose, has not been settled. I am reluctant to press you, but as I have some heavy payments to make in the early part of next month, I must request that you pay the amount before the close of the present month.

Respectfully yours,
John Adams.

A Demand for Payment of Rent.

1409 North Ninth St.,
Philadelphia, Pa.
June 5, 1904.

Mr. Thomas F. Smith.

Dear Sir:

I feel obliged to remind you of the fact that you owe me $120 for three months' rent. You will remember that, according to the agreement, you were to make monthly

payments; therefore, if the account is not settled within a week, I shall be obliged to place the matter in the hands of my lawyer for collection, as I cannot allow it to run any longer.

Truly yours,
Henry S. Holmes.

Introducing a Young Man Seeking a Position.

Akron, Ohio, June 1, 1900.

My Dear Sir:

Recognizing your well-merited and extensive influence in the commercial circles in your city, I beg to introduce to you Charles F. Pogle, who is desirous of obtaining a position with a mercantile house. He is a gentleman of capacity and ability. His character stands A 1, and he is as industrious as he is energetic. He considers New York a better field than this place, and prefers to try his chances there to remaining here. He can refer to me. Trusting that you will lend him a helping hand, I am, Yours, very truly,

James B. Marvel.

Mr. Edward Fetter,
19 Park Row, New York

Social Letters.

Let these be original and not be like the epistles of some one else; write as you would talk, but always exercise care in the use of pure, simple language and avoid a stilted or artificial style. Especially in the long letters of friendship and love—those missives that reveal the heart—the language should show that the heart is pure. Let your letter be the record of the fancies and mood of the hour; the reflex of your aspirations, your joys, your disappointments.

Write cheerfully. It is unkind to your friend to fill your letter with complainings and accounts of your troubles, though there are occasions when one may confide all his sorrows to the near friend, and receive in return a letter of sympathy, containing all the comfort it is possible for a letter to convey.

The length of social letters must depend upon circumstances and degree of intimacy. To members of your family real chatty letters telling of all the little incidents of your life, its pleasures and adventures are always proper. In fact, these need be limited only by your time and paper. To others you must not write such long letters.

The following is a feeling letter of condolence, written by Frances Ridley Havergal to a lady friend:

Leamington, Dec. 10, 1870.

Dear, Dear Mrs. Smith:

What can I do but just weep with you! I can only guess what this sorrow is. Only I know it must be the greatest, except one, which could come to you. That dear little, beautiful thing! He looked so sweet and happy when I saw him; no baby face ever haunted me as, somehow, his did. If you could only see him now, how beautiful he must be now that he has seen Jesus, and shines in the light of God. It is even more wonderful to think of that great transition for a baby than for a grown person; one cannot imagine the sudden expansion into such knowledge and conscious joy.

I was looking back this morning upon long memories of soul-trials, years of groping and stumbling and longing, sinning and sorrowing, of heart weariness and faintness, temptation and failure; all these things which I suppose every Christian must pass through, more or less, at some stage or other on the way home; and the first distinct thought which came through the surprise and sorrow at the sad news was, "That dear little redeemed one is spared all this, taken home without any of these roughest roughnesses of the way; he will never fear doubt or sin, never grieve his Saviour." Is it not the very best and kindest thing that tender Saviour could do for him? Only it is not what you meant when you prayed that he might be his own.

But better he is with him at once and forever, and waiting for you to come home. I am only writing all this because my heart is full, and must pour out a little. I know we cannot comfort,—only Jesus can; and I shall go and plead long and intensely for this as soon as I have closed my letter. He must be specially "touched" in such a sorrow, for he knows by actual experience what human love is. Three such great sorrows in one year! How specially he must be watching you in this furnace!

Yours with deepest sympathy,
Frances R. Havergal.

This may fitly be followed by a letter of congratulation, of which we give a manufactured example. Too often it is the case

that friends forget to congratulate those they are interested in when good fortune of any kind comes upon them, or to commiserate with them in cases of disaster or misfortune. These letters not only are proper but very acceptable. The one receiving such letters should not fail to acknowledge them. They properly should not be very long or very effusive.

New York, May 8, 1903.

My Dear Mr. Williams:

It is with deep satisfaction that I learn of your good fortune. I have long hoped that the clouds which lowered over you would be lifted, and sincerely hope that you have fairly entered upon a tide of prosperity. In one who, like you, have been true and honorable in all your actions, and have suffered in means through honesty in dealing, the coming of a measure of success like this should be especially gratifying.

May you continue to prosper, and if in any way I can advance your interests in this quarter do not fail to make use of me. Present my best wishes to Mrs. Williams, and believe me

Sincerely yours,

James Dobson.

From Charles Dickens to James T. Fields.

As an excellent example of a reply to a letter conveying pleasant wishes, we present the following from Dickens:

Gad's Hill, June 10, 1867.

My Dear Fields:

Your letter of May 27th comes to me like a breath from your own world beyond the sea. Believe me, I reciprocate all your good wishes, and take this occasion to renew those sentiments of respect and affection for yourself which it has been my privilege to entertain for so long a time. In the busy hours of exacting labors, I recall with pleasure the choice friends whom it has been my happy lot to meet. Time does not rust, but brightens, the links of the golden chain. With every good wish for your personal health and enjoyment, I am, as ever,

Yours most sincerely,

Charles Dickens.

Mr. James T. Fields,
Boston, Mass.

From Charles Sumner on Leaving for Europe to his Ten-year Old Sister.

Astor Honse,
New York, Dec. 7, 1837

My Dear Julia:

I don't remember that I ever wrote you a letter. I feel confident, however, that your correspondence is not very extensive; and therefore I flatter myself that what I write you will be read with attention, and I trust, also, deposited in your heart. Before trusting myself to the sea, let me say a few words to you which shall be my good-by. I have often spoken to you of certain habits of personal care, which I will not here more particularly refer to than by asking you to remember all I have told you.

I am very glad, my dear, to remember your cheerful countenance. I shall keep it in my mind as I travel over sea and land, and hope that when I return I may still find its pleasant smile ready to greet me. Try never to cry. But above all things never be obstinate or passionate. If you find your temper mastering you, always stop till you count sixty before you say or do anything. Let it be said of you that you are always amiable. Love your father and mother and brothers and sisters, and all your friends; cultivate an affectionate disposition.

If you find that you can do anything which will add to the pleasure of your parents, or anybody else, be sure to do it. Consider every opportunity of adding to the pleasure of others as of the highest importance, and do not be unwilling to sacrifice some enjoyment of your own, even some dear plaything, if by doing so you can promote the happiness of others. If you follow this advice you will never be selfish or ungenerous, and everybody will love you.

Study all the lessons you have at school, and when at home, in the time when you are tired of play, read some good books which will help to improve your mind. . . . If you will let Horace read this letter it will do the same, perhaps, as one addressed to him. Give my love to mother, and Mary, and the rest.

Your affectionate brother,

Charles.

ETIQUETTE OF BEAUTY

During all civilized ages the art of beauty has been sedulously studied and practiced by the fair sex, women in all periods since the days of barbarism having sought to preserve and increase the charms bestowed by nature and carry the freshness of youth as far forward as possible into the domain of middle life and even of old age. Experience extended through many centuries has yielded numerous "rules of conduct" in relation to physical hygiene and the care of the body, while physicians have learned much in respect to the preservation of health and beauty. How to keep a clean soul in a clean body is the first law of health. In the study of the fine arts there is nothing of more importance than the art of making a beautiful woman. It is this art with which we are at present concerned. Though no one can be taught how to convert ugliness into beauty, or to stay the footsteps of age, yet what share of attractiveness nature has given can in great measure be retained and enhanced, while, if the advance of age cannot be checked, its ravages may be alleviated and its harshness softened by the employment of physical hygiene and refined care of the body which God has given us.

How to Grow Old Gracefully.

A charming old lady revealed the secret of her fair and rosy complexion to a group of young women as follows: "Late hours," said she, "and oversleeping ruin the complexion. Go to bed early, arise early, and you will grow old slowly, and retain your good looks to an advanced age. If, however, your position forces you into society and you are obliged to be up late at night, sleep an hour every afternoon. Before going to bed take a hot bath and remain in the water only a few moments. Then drink a cup of bouillon, and a small glass of Malaga wine. Sleep will soon follow, and last until the natural time of awakening, which is about ten o'clock in the morning under these circumstances. Take a cold plunge or sponge bath, a light breakfast of *café au lait*, and bread without any butter."

She continued: "Out-of-door exercise is an absolute necessity, but must not be carried to excess. A daily walk is excellent, and it is scarcely necessary to say that whole days of lawn tennis, croquet, etc., are not favorable to the complexion."

Care of the Body.

Wear warm, light garments, to secure an even temperature. In winter it is even more important to protect the spine than the chest. Wear a silk sleeveless jacket next the skin, if you do not wish to wear a flannel one. At any rate, if you are delicate, young or old, cover the spine with a strip of flannel tied by a ribbon, and extending to the hips. There will be no need to fear colds, bronchitis, or phthisis, if this precaution is taken, and it does not prevent wearing a *decollette* gown.

Never wear tight clothing. It is injurious to health and beauty. The face becomes congested when the organs are compressed, the hands swell, and get red, and the carriage awkward. Wear easy corsets, gloves, and shoes.

To keep the pores of the skin open, one should bathe daily in cold or warm water; ill health and age are thus retarded. The result of uncleanliness is a flabby and unwholesome condition. The well cleansed skin is soft, smooth, fresh; a skin on which perspiration and dust have accumulated in layers becomes dry and feverish. But it may be said that it is not possible for the greater number of people to take a daily bath, as they lack the facilities and the time. The sponge bath—which is all sufficient for the purposes of cleanliness—requires only a few minutes each day. Once or twice a week at least, one should take the time necessary for a full bath. This is the very least attention our bodies require.

Immersions and baths, with the aid of soap, lotions, etc., will render the body strong and flexible, and give it a power of resistance. Water has the virtue of dispelling fatigue and destroying the germs of disease. While cleansing the body it purifies our souls and gives us "a sound mind in a sound body."

The Bath-Room.

The furnishing of the bath-room depends largely upon the means and taste of its owner. It is no difficult matter to furnish a simple bath-room, in which comfort may be preserved while the unattainable elegancies of the rich are banished. The walls of this room may be painted in oils—in imitation of marble, if desired. Over the floor of wood or tiles a carpet of linoleum should be spread. In front of the bath-tub should be laid an India-rubber mat, on which to step on leaving the bath. On the walls may be placed shelves for soap, sponges, etc., within easy reach of the hand while in the water. On racks or in a wardrobe should be hung the bathing linen, towels, dressing sacks, and other necessaries of the bath.

The human skin is a complicated net, whose meshes must be kept open and unclogged, in order that through them the body may throw off its impure secretions. The healthy action of the skin is stimulated by the opening of the pores in the bath, especially if it is followed by friction with a brush or rough towel.

Instead of the bath-tub and its accessories, the needs of cleanliness may be met with a large zinc tub, a pail, and a small basin of water, with a suitable sponge. In this method of bathing first use warm water; then, if in good health, lower the temperature of the water until, finally, the bath can be taken cold. In all cases the temperature of the room must be moderately warm. People whose lungs are weak should always bathe in warm water.

Partial baths, of any kind, are almost always taken warm. It is unwise to bathe immediately after eating, as it seriously interferes with digestion. There should be at least three or four hours between a full repast and a bath.

In the springtime, when one is more susceptible to cold than at any other season of the year, it is best to bathe at night, just before going to bed, in order that the skin may profit by the warm moisture which it retains for several hours after leaving the bath.

The practice of massage, by the hands of an experienced operator, is of great value in certain states of the health. But, fortunately, ordinary friction can replace this practice without assistance, thanks to the various appliances for the purpose of rubbing one's self over the shoulders and back, which the hands cannot reach easily. The friction is produced either with the bare hand, or by means of gloves or bands of horse-hair, or of rough woolen or linen cloth. When no liquid is employed, such friction is called dry.

The Dressing-Room.

A woman's dressing-room should be as tasteful and comfortable as her social position and fortune permit: simply comfortable if she cannot afford luxury, but supplied at least with all things necessary and useful to a careful toilet.

Where convenient, two dressing-tables should be provided, facing each other, different in dimensions, but identical in form.

The larger serves for the minor ablutions. It is provided with a water pitcher and bowl of porcelain, crystal, or silver, selected with the taste which distinguishes us in these days. Above it fasten a little shelf on which to place perfumes, smelling salts, dentrifices, elixirs, etc. Beside the bowl place a soap-dish, a box for brushes, etc.

The smaller dressing-table should be surmounted by an adjustable mirror, framed in silk and muslin. The hair is dressed before this table. It must be supplied with all needful accessories—brushes and combs, perfumes, creams and lotions, powder-boxes, powder puffs, manicure set, etc. Projecting brackets for lights should be on each side of this table.

The dressing-room may be far more simple than here described. If it lack all luxury, a woman of taste may give it an attractive appearance. Select a tasteful wall-paper. Cover the floor with a pretty rug. Tables of pine may be draped with cretonne bordered with a ruffle. Over your dressing-table spread a linen scarf trimmed with inexpensive lace. Above it hang small brackets covered like the table, on which place the boxes, bottles, jewel vases, etc., which may be graceful and elegant despite their small cost. If the mirror is ordinary,

conceal the frame by a drapery to correspond with the table. This is easily arranged by means of hidden tacks. Secure a very simple wardrobe, which you can greatly improve by painting and varnishing. Conceal the water jugs and pails under the valance of the table.

Some shelves at the end of the room, with hooks beneath them to hold articles of clothing, the whole concealed behind curtains in harmony with the drapery of the table, will answer the purpose of a wardrobe. The curtain should hang freely from the ceiling, so as not to expose the outlines of the objects behind it. Beneath it the zinc bathing tub may be hidden.

The Complexion.

It is generally thought that the color and texture of the skin may be improved by external means. This is partially the truth, but is largely an error, since the complexion depends to a great degree on the health and temperament. We must look to hygiene rather than to cosmetics to supply the defects of color.

A complexion which is too highly colored, especially if the color is deep and extends over nearly the whole surface, is neither desirable from an æsthetic nor from a hygienic standpoint. It indicates plethora. It will be noticed that those persons who are afflicted with high color, whose eyes even are veined in red, are usually large eaters, lovers of ease, and averse to fatiguing exercises. In order to tone down their color, they should restrain the appetite, select less succulent food, and take less ease. Their health will be improved by the directions here given; headaches, confusion of thought, dizziness, will disappear; from violent, the color will become merely brilliant, which is a very different thing, for a bright color is not objectionable if confined to the cheek, as it makes the rest of the face fairer by contrast.

When the complexion is muddy, wan, pasty, too white, greenish, yellow, or purple, it is always a sign of bad health. A muddy skin is sometimes natural, but frequently indicates dyspepsia, feeble circulation, etc.

A pale skin is usually due to a life spent within doors, lack of exercise, the habit or necessity of avoiding sunlight and daylight. A pasty skin is the result of a lymphatic temperament. An olive skin does not always indicate disease; it may have been inherited from some creole ancestor. A too white skin, without proper admixture of color, shows a person in serious ill health, although sometimes there are no other indications. A purplish complexion may come from some affection of the heart. A yellow skin requires especial attention. It is plain that care and precaution should be taken when the complexion is defective.

Hygiene is in many cases sufficient, and we shall try to trace the prominent outlines of this preventive treatment, at least so far as women are concerned.

Facial Ablutions.

It is well known that the pores of the skin should be kept open in order to perform thoroughly their functions, and that washing is an excellent means to relieve them of the secretions or accumulations which obstruct and close them. There are, however, precautions to be taken when washing the face. If there is any eruption on the face, warm water should be used. By this means the blood is driven away and the congestion relieved.

When the weather is very warm, or when the face is heated, do not wash in cold water. Bathe in warm water with pure soap. Take care to rinse thoroughly, so as to remove every particle of soap. Powder lightly, allowing the powder to dry on the face.

The face should be then carefully wiped on a piece of soft linen. Rough friction, with a coarse towel, has the effect of thickening some skins. It is well to remember that the skin requires the same delicate care that we bestow on fine porcelain or other rare treasures.

It is said that one of our society beauties every night on going to bed saturates a toilet towel in very hot water, wrings it, and applies it to her face, keeping it there for half an hour. This woman has no wrinkles.

A woman, fifty years old, whose skin is as smooth as that of a young girl, has never used anything on her face but hot water, which she believes prevents the skin from

becoming flaccid and wrinkled. One of her friends does the same, but immediately after washes her face in cold water, and her sister uses hot water at night and cold in the morning.

All these apparent contradictions depend doubtless on different conditions of the skin. A well-known physician advises washing the face in cold water in the winter, and in warm or hot water in summer, thus establishing harmony with the existing temperature.

Hard water, which does not dissolve the soap, should not be used for washing or bathing. If no other is to be had, the water for face-washing may be softened with a little borax or a few drops of ammonia.

Lemon juice cleanses the skin very well, and sometimes serves the purpose better than soap. Strawberry juice has the same effect, besides being very improving to the skin.

Dr. Kingsford believes that, in many cases, the skin of the face may be kept smooth to an advanced age by the following mechanical process: The fingers being slightly oiled, the skin of the face should be rubbed, gently but firmly, in a direction opposite to that in which wrinkles threaten to form. This should be done at least once daily, and for five minutes at a time. The pressure must be even, firm, and gentle, and the oil on the fingers occasionally renewed. In this process the effect may be much augmented by the use of wool fat, a substance which is extracted from sheep's wool. Its value consists in the fact that it is readily absorbed by the skin, and thus serves to replace the subcutaneous fatty tissue, where deficient, and give a full, smooth, and rounded outline to the skin. Cold-cream prepared from this wool fat and cucumber juice is a very valuable cosmetic, from the readiness of its absorption by the skin, ordinary oils and fats lying on the surface, without absorption, and forming a greasy film.

To Remove Sunburn.

Bathe your face at night with a cold infusion of fresh cucumbers sliced in milk. A decoction of tansy in buttermilk is still more efficacious. Buttermilk alone is excellent.

Another means of overcoming the effects of sea or wind is to wash the face with the juice of green grapes prepared in the following manner: Wet the grapes and powder lightly with alum; wrap in a white paper and cook under hot ashes. When the grapes become tender they are sufficiently cooked. Remove them from their covering and squeeze into a cup. Wash your face in the liquid three times within twenty-four hours. This remedy is said to be infallible.

Another treatment, practiced in Italy, is to bathe the face with the white of an egg, well beaten. Let it dry on the skin, and rinse it off in soft water after fifteen minutes. This treatment is repeated three or four times, always at night, just before retiring.

Lastly, good results may be had from the use of a mixture of equal parts of glycerine and lemon juice. If glycerine does not agree with the skin, use rose-water.

Freckles.

Freckles are the despair of blondes, and even of brunettes with fair skins. Some physicians attribute them to too much iron in the blood, and think that they may arise from the abuse of iron tonics. Others say that they indicate a delicate constitution and feeble circulation.

They may sometimes be prevented by a few very simple precautions. The following mixture has been used with success: One part of tincture of iodine to three parts of glycerine, applied to the freckles before going to bed.

Another remedy is the following: Take one-half pint of oil of turpentine; dissolve in it seven grammes of pulverized camphor; add two grammes of oil of sweet almonds.

The following is another excellent remedy: Twenty-eight grammes of crushed camphor and 112 grammes of pure olive oil. Let the camphor dissolve slowly in the oil.

Applications of buttermilk are also excellent here, as in the case of sunburn.

The following remedies are also recommended: In twenty centigrammes of rose water dissolve sixteen centigrammes of borax:

Fresh beans, boiled in water, crushed and applied as a poultice on the freckles, will produce excellent effects.

Make a mixture of vinegar, lemon-juice, alcohol, oil of lavender, oil of rose, oil of cedar, and distilled water. Apply to the freckles on retiring, and wash the face in soft water next morning.

Two parts of sugar of watercress to one of honey is highly recommended for removing both large and small freckles. Strain through a cloth and apply morning and night.

Depilatories.

The growth of hair which so often appears on the chin at middle age, and the down which imparts a masculine appearance to the rosy lips of some young girls of twenty, form causes of annoyance from which some suffer distress of mind. There are, fortunately, remedies for this affliction.

Removing these hairs with a small tweezer of steel is one of the common methods. But the hair must be carefully pulled and not broken; it should be removed by a sudden jerk. Recently an operation by electricity, to which the name of electrolysis is given, has been highly recommended. It is, however, often unsuccessful, and always painful.

Make a wash of the leaves and roots of celandine distilled. Make a compress, apply to the hairy spot, allowing it to remain on all night. Continue until the hairs disappear.

Use polypode of oak; slit and cut into pieces, place in a cucurbite (vessel resembling a gourd used in distillation) and pour over it some white wine, which should cover the polypode a finger's width. Let it stand for twenty-four hours. Then distil in boiling water until no more evaporates. Apply in compresses on the afflicted parts, keeping it on all night. Renew until the desired effect is produced.

Face Washes and Cosmetics.

Never use any kind of paint on the face. All rouges injure the skin. Blanc de perle is dangerous.

Greasy skins are benefited by washing in the juice of fresh cucumbers. Equally good is the water in which spinach flowers have been boiled. The juice of strawberries is still better.

During the sixteenth century the water in which beans had been boiled was in vogue for the complexion. This farinaceous water is entitled to the fame which it possessed. Belladonna (beautiful lady) derives its name from the use which the Italians of the Renaissance made of its juice to improve their complexions.

The following lotion is excellent: A wineglassful of lemon juice, a pint of rain water, five drops of essence of rose, well corked. Wash the face occasionally with this mixture, which often prevents the discoloration of the skin.

Soft and relaxed skins will be improved by the use of the following cosmetic (at intervals of eight days): One part milk, one part whisky. Moisten a soft towel with the mixture, after having first washed the face. The results do not follow immediately, but within a year the skin will frequently contract, become firm, fine, and soft.

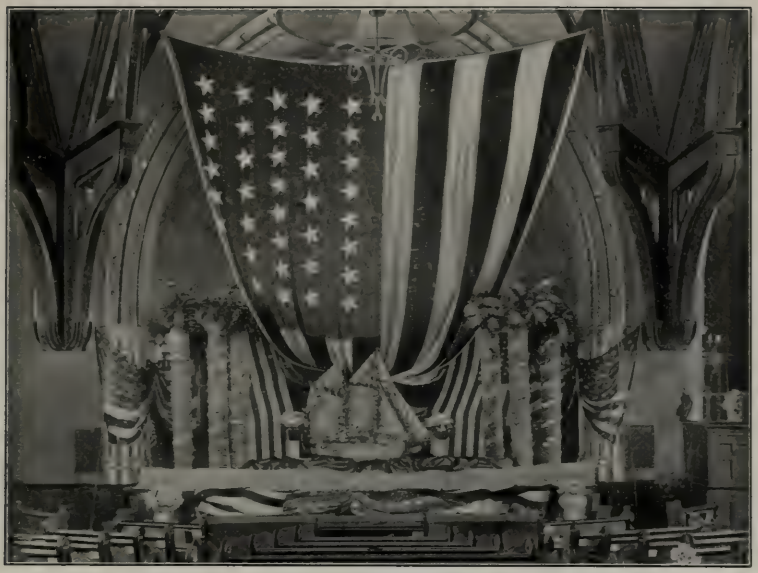
An excellent cleansing wash, used by our grandmothers, and known as "virginal milk," is prepared as follows: Take one quart of rose, orange, or elder-flower water, and add to it, drop by drop, stirring constantly, an ounce of simple tincture of benzoin. (Be careful not to use compound tincture). A few drops of glycerine and twelve or fifteen minims of tincture of myrrh may be added.

For greasiness of the skin the use of stimulating and astringent washes is necessary. The following is an excellent recipe: One ounce of dried rose leaves, one-half pint of white-wine vinegar, one half-pint of rose water. Pour the vinegar on the rose-leaves and let it stand for a week; then strain and add the rose-water. Bathe the face morning and evening by wetting the corner of a soft towel with the lotion.

Where the oiliness is considerable, use the following lotion, applying it two or three times a day:

Sulphate of zinc, two grains; compound tincture of lavender, eight minims; distilled water, one ounce. Mix thoroughly.

Toilet vinegars are frequently made with diluted acetic acid, into which are infused rose-leaves, lavender, verbena, or some other perfume. All toilet vinegars should be much diluted. The best time to use



PATRIOTIC DECORATIONS

Decorations used to instil patriotism are the most commendable of the many public occasions.—Children's Days, Commencements and National holidays are the most popular. Flags and bunting, banks of daisies, a "Ship of State" and floral columns are seen in this illustration.

DECORATIONS FOR A WEDDING

This is an interesting view of elaborate designs in arches and festoons. The green and white in the arches and in the pulpit decorations are easily procured and arranged.

them is in the morning after bathing, in order to cool the skin, remove any appearance of greasiness, and give tone to the epidermis. But they must on no account be used soon after soap has been applied, because the acid of the vinegar will decompose the soap and seriously injure the skin.

The Use of Rice Powder.

It is sometimes necessary to powder the face, but powder should be applied lightly and artistically in order to impart to the skin the velvety softness of the peach. Powder on the face should be imperceptible, and, if used with discretion, is not to be condemned.

Take up but a small quantity of powder on the puff, and pass lightly over the face. Care should be taken not to powder the eyebrows, and the lips must be carefully wiped to remove any powder which may have fallen, The whole face, except the eyes, the eyebrows, and lips, should receive a touch of powder.

Acne or Blackheads.

Acne is the commonest form of facial eruption, it appearing as small black points on the nose, cheeks, and chin. Each speck marks an obstructed outlet of the sebaceous glands, and if pressure be made on either side, the oily secretion may be pressed out in the form of a small white worm. With care in softening the skin before pressing, blackheads may be removed without leaving a scar, and through proper treatment, their return may be prevented.

For three weeks, or until the skin is thoroughly softened, apply Récamier cream every night before retiring. Let the cream remain on the face during the night. In the morning wash it off with water, as hot as can pleasantly be borne, and a little pure soap. Rinse the face thoroughly with cooler water. At the end of three weeks the blackheads will, in most cases, have been expelled by the treatment. In obstinate cases proceed as follows:

Before attempting the removal of these blemishes, apply a little Récamier cream. Press on either side of the clogged pore until the so-called "worm" is forced out. Be careful not to be rough and injure the skin by sharp finger nails or any steel instrument; if the sebaceous matter will not come out, it is because the skin is not properly softened, and you must patiently continue the first part of the treatment. Operate on the blackheads at night, if possible, before retiring, and do not attempt to get rid of all at one time. After the matter is forced out, bathe the face in warm water, in which put a little pulverized borax, and also use a little pure soap, that the now emptied folicle may be thoroughly cleansed. Continue this treatment until the black heads are all gone.

Do not imagine, however, that these troublesome imperfections will not return if the skin is neglected. Nothing but care and great cleanliness will effectually banish these obnoxious visitors.

Redness of the Nose.

If this affliction is due to the dryness of the nasal passage or the delicacy of the capillary vessels, the inflamed condition may easily be removed. The following wash can be recommended: Powdered borax, ten grammes; one teaspoonful cologne; soft water, 150 grammes. Melt the borax in the water, then add the cologne. It is sufficient to moisten the nose with the wash and let it dry without wiping. When it begins to burn again, the treatment should be renewed.

Here is another and similar wash: Dissolve two grammes of borax in fifteen grammes of rose-water, and as much orange-flower water. Moisten the nose three times each day with this refreshing wash.

Cleansing of the Hair.

The frequent use of a fine comb is fatal to hair, especially when it is falling out. However, it is necessary to cleanse the hair and the downy scalp.

The Chinese, who have abundant, but coarse, hair, use a mixture of honey and flour.

The following is an English recipe: Add a teacupful of salt to a quart of rain-water. After twelve hours this brine is ready for use. To one cupful of the mixture add one cupful of hot rain water. Wash the hair and scalp, rub well, rinse, and dry with a towel.

The creoles of Cuba make a decoction of the leaves of rosemary. This water, they maintain, cleanses, strengthens, and softens the hair.

This also is excellent: Take fifty grammes of the roots of soap-wood boiled in a pint and a half of water. Wash with the hot preparation, then dry the hair and scalp with warm cloths.

The yolk of an egg cleans the head thoroughly and causes the hair to grow. Only the scalp should be rubbed with the yolk, and the head rinsed in hot water. The beaten white of eggs is also recommended as a simple and efficacious preparation for cleansing the hair. Rub the scalp, and rinse in hot water.

The custom of shampooing originated in England. Take one quart of cold or hot water into which is melted thirty grammes of carbonate of soda and fifteen grammes of soap, cut into small pieces. Add a few drops of perfume and thirty grammes of spirits of wine. After washing with this preparation, rinse the hair in warm water. Afterward rub the hair and scalp until dry with warm towels.

The hair should always be thoroughly and rapidly dried. After drying, let it hang loosely on the shoulders for an hour or two if necessary.

Hair, especially gray, may be cleansed with powder. Afterward, it should be carefully brushed. This is an excellent method, though it is difficult to remove the traces of powder from dark hair.

Diseases of the Hair.

Dandruff is not only very disagreeable, but produces baldness. Before resorting to medical treatment for this disease, which is sometimes obstinate, because it depends on a bad state of health, try one of the following simple remedies: First, melt sixty grammes of crystallized soda in a quart of water; add thirty grammes of cologne water. Moisten the hairbrush in the liquid and pass it each day over the affected part. Second, a physician recommends the application of lemon juice to the scalp. Keep the juice as much as possible from the hair. Third, take ten grammes of Panama wood; boil in a pint of rain-water. Wash the affected parts with this decoction two or three times each week.

When the hair falls out without apparent cause, it is diseased. This is the case when the ends split. Sorrow causes the hair to fall out. For this there is no remedy save time and forgetfulness, and happier days.

An animal is known to be unhealthy if its hair is not soft and shiny. It is the same with men and women, and if this is the case it is important to consider the state of the health. A good treatment for hair under these circumstances is to rub the scalp with soap and a mixture of castor-oil, sweet almond, and tannin.

When, after cases of short and severe illness or long-continued ill-health, the hair falls out, as the saying goes, "by the handful," it should be cut quite short and kept clipped for at least a twelvemonth, rubbing the scalp regularly with some wash possessing tonic qualities.

Another point to be carefully noted is the manner of cutting the hair. The weakest and thinnest growth, when the hair has a marked tendency to fall out, is almost invariably along the central parting and about the crown. At these parts, therefore, the hair should be clipped more frequently than anywhere else, and the utmost care should be used to keep the hairs on the top of the head shorter than at the sides and back, where the growth is stronger. Unfortunately, however, the opposite course is generally pursued, the locks at the sides and back being often very closely clipped, while the hair on the crown and along the parting is left quite long.

Grease must never be used; it will fill the pores of the skin and injure the delicate new growth. A weak solution of the essential oils of thyme or rosemary, strong rosemary tea, or ammonia, very much diluted with water, may be rubbed in to stimulate the growth.

Baldness.

Baldness is not so serious a matter to a man as to a woman, for he has the comfort of knowing that he has many companions in his misery.

But a bald woman is really to be pitied. It is impossible to accept such a misfortune with resignation; she must conceal it by

every means in her power. She is often compelled to resort to a wig, or to caps such as are worn by dowagers.

The growing tendency to baldness among women has been attributed to the use of hot irons for crimping; to false hair; to overheating the scalp by head-dresses. It is, perhaps, still more due to the use of dyes.

We no longer wait for gray hairs, but vary the color of the hair to suit our caprices, and quite frequently the brunette of to-day may appear to-morrow with golden or even red hair. Those who have black hair sometimes stain it mahogany color. Blondes whose hair is growing darker lighten it by the use of oxygenated water, which removes the color. Many woman will resort to any means rather than allow the hair to grow gray naturally. Such practices are much to be condemned. Let us remain as we are, content to grow old gracefully.

Remedies for Falling Hair.

The juice of a lemon applied to the scalp is said to be a remedy for the falling out of dark hair.

The following recipe has been used successfully: Wash the head each night, rubbing in carefully the following mixture: one teaspoonful of salt and one gramme and a half of quinine, added to a pint of brandy; mix well.

The following remedy has also been used with good results: Steep three common onions in a quart of rum for twenty-four hours; remove the onions and apply the liquor to the scalp every second day. The slight odor of onions soon disappears.

The English medical journal, *The Lancet*, recommends the following pomatum: Tincture of jaborandi, fifteen grammes; lanoline, nine grammes; glycerine, sixty grammes. Mix with a little soft soap, and apply to the scalp every night.

Good results have been also obtained by using walnut leaves steeped in water. Dip a small sponge into the liquid, and moisten the scalp each night. In the morning use the following prescription: Perfumed soft animal fat, sixty grammes; tannin, two grammes; tincture benzoin, six grammes.

After an illness it is unwise to shave the head. The hair will not fall out if cut at intervals of three weeks. Each time a certain quantity must be cut, proportionate to the whole length of the hair; the last cutting should be about to the lobe of the ear. False hair should not be worn, as it sometimes causes total baldness. From the day on which the hair is first cut, the head must be rubbed with a mixture of equal parts of rum and castor-oil. Hot sage tea is also recommended, provided the head is well dried with a warm towel.

Cleansing of Combs and Brushes.

Nothing is better for cleansing brushes than ammonia; it does not soften the bristles, as soap and soda do. Put a teaspoonful of ammonia into a quart of water, and soak the bristles in the solution (keeping the ivory, bone, or varnished back out of the water). The brush must then be rinsed in fresh water and dried in the air, but not in the sun.

Combs should never be washed. They may be cleansed by passing a coarse thread or card between the teeth. There is also a small brush which is used for cleaning combs.

The greatest cleanliness is necessary for all articles used for dressing the hair.

If you use ammonia in your bath, avoid wetting the hair except when necessary, because ammonia fades the hair.

Care of the Eyes.

Never rub the eyes, for this practice causes inflammation of the lids, and however beautiful the expression, if the eyes are red or without lashes, they lose their charm.

Avoid all ointments, washes, etc., not prescribed by a good physician or oculist. It is impossible too strongly to denounce the use of so-called "eye-beautifiers." Many women have ruined their eyes from just such folly.

If the eyelids are inflamed, wash them in rose-water and plantain. The juice of the strawberry strained through a piece of linen is very efficacious.

An old physician has advised the use of elderberry-water for the painful itching sometimes felt in the eyes.

A physician recommends the following prescription: One quart of soft water, a pinch of common salt, a spoonful of brandy. Allow it to dissolve. Shake well before using. This wash will strengthen the sight and restore its powers.

A skillful oculist says that the eyes should be bathed night and morning. Cold water will serve while young, but after middle age use water as hot as the hands can bear; rinse with cold water afterward. This is recommended as a great preservative of the strength of the eyes.

However strong the eyes may be, give them a little rest after a few hours' continuous use. Never force them to gaze at minute objects when they are weak; never read, write, or sew with too dim a light. During all continuous work close the eyes at intervals for a short time. The light should fall from the side or over the shoulder, not full in the face. Never read or write while lying down. Do not read while traveling or walking, or while physically tired. Hygienic conditions, sobriety, the avoidance of all excesses, are rewarded by good eyesight.

Care of the Teeth.

Cleanliness is one of the surest means for overcoming the causes which lead to the destruction of the teeth. They should be carefully brushed night and morning; it is a good practice to rinse the mouth after each meal, if possible; the particles of food which lodge between the teeth decompose and cause, sooner or later, the abominable tartar which is so fatal to teeth.

Some persons use cold water in cleansing the teeth and rinsing the mouth. I advise warm water for both purposes. One should use an infusion of mint or the following mixture: Three grammes of borax and nine grammes of pure glycerine, in a quart of warm water. The first and more simple wash is the better.

It is sufficient to brush the teeth with soap two or three times each week (without interfering with the daily cleansing). For this a very pure soap should be used. It is not an agreeable process, but one soon becomes used to it, and the results are very desirable. Soap contains alkali, and alkalies are highly recommended for the teeth. They are antiseptic, and, therefore, very useful for the mouth. Soap removes the deposits on the teeth, which many of the most famous powders do not, except by destroying the enamel which protects them.

Teeth should not be brushed too long at a time. Doing this injures the gums, and in this way the teeth may be loosened. The upper teeth should be brushed from above downwards (from the gums toward the edges), the lower teeth from below upwards. The inside of the teeth should be as carefully brushed as the outside.

The gums must be well cared for, for when they are healthy there is a better chance that the teeth will be healthy also.

When they are soft the following powder will harden them: Peruvian bark, fifteen grammes; powdered ratanhia, six grammes; chlorate of potassa, five grammes. These powders should be well mixed so as to form but one, with which the gums should be rubbed three or four times daily.

The gums must be gradually accustomed to vigorous friction. When soft, gums bleed easily. They should be washed in an infusion of gentian or blackberry leaves, into which are put a few drops of the tincture of Peruvian bark, or cologne. Lemon juice also has excellent effects on gums which are soft, or even where there is ulceration. Dip a little soft brush in the juice, and carefully pass over the sore places without touching the teeth. Painting the gums with a tincture of ratanhia and the tincture of pyrethrum in equal parts is often recommended. Apply at night.

A decoction of myrrh, tannin, and oak bark is an excellent astringent for tender or bleeding gums.

There are foods which injure the teeth—sugar, sweets, pastry, etc. The abuse of acids destroys the enamel of the teeth. Figs, like sugar, relax and soften the gums; oils, natural fat, or grease, do them no good.

Be careful not to drink anything very cold immediately after swallowing soup. The teeth will suffer from the violent change of temperature.

Care of the Hands.

In doing housework or gardening, old gloves which have lost their freshness and grown large by use may be worn. They will protect the hands from the effects of the air, and keep them clean. Too frequent washing is open to objection, but there are many labors which cannot be performed with covered hands, and in that case they must be washed as often as necessary. A perfectly pure soap should be used. A little almond meal may be put into the warm water in which the hands are washed, and if they are much soiled a little borax or ammonia may be added.

The roughest hands will be softened if care is given them before retiring at night. It scarcely requires five minutes to efface the traces which the rudest labor may have left on the hands. And the necessary articles are not expensive. A nail brush, a box of rose paste, a box of nail powder, a vial of ammonia, almond meal, and French amandine and a lemon are useful.

If a callous spot forms on the inside of the hand it must be rubbed, as patiently and for as long a time as may be necessary, with pumice stone. The operation preserves the softness of the hand and the delicacy of touch.

Stains may be removed by lemon, borax, or ammonia, according to their nature. When the hands have been perfectly cleansed, rub them with French amandine. Wear gloves while sweeping.

If glycerine were not injurious to many skins it would be excellent. The following mixture will be acceptable to those who can use glycerine: The yolk of an egg, six grammes of glycerine, seven grammes of borax. Mix well. Rub the hands with this salve, and cover them with gloves. Almond meal will do as well.

If the hands are very rough, and have been much used, cold-cream may be employed with great advantage at the beginning of the daily treatment which has been suggested. After using for one month the hands will be sufficiently improved to need only almond meal.

Women who do no domestic work may keep their hands white by simply washing them night and morning in bran-water.

Washing the Hands During the Day.

Never have soiled hands, but do not wash oftener than necessary. Lemon juice will remove many stains. If a little salt is added to this juice it is still more efficacious.

A bit of orange or lemon skin removes tar stains. Care must be taken to wipe the hands dry immediately. Fresh tomatoes and strawberries, a leaf of sorrel, a little milk, are excellent for removing ink stains.

Before peeling Irish potatoes, the hands should be well dried, and should not be washed immediately after. By this slight precaution they will not be stained with the juice of the tuber. After paring certain fruits and vegetables a little lemon juice removes all stain. The hands must first be moistened in water.

To cleanse the hands after very rough work use a good emollient or cream. Rub the hands with a small quantity of the emollient, which will penetrate well into the pores of the skin and become incorporated with the greasy substances. Wash the hands in hot water and soap. This treatment make them very soft.

Hands which are "sanctified by labor" may thus retain an agreeable appearance, which is not to be disdained, especially when it is so easily obtained.

Moist hands are unfit for certain kinds of work, and are unpleasant to the touch.

To keep the hands agreeably dry, rub the palms several times each day with a cloth soaked in the following preparation: Cologne water, seventy grammes; tincture of belladonna, fifteen grammes.

Hands which have a tendency to perspire too freely when exposed to the slightest heat may be washed in water in which a little powdered alum has been dissolved.

Sunburned Hands.

At the close of summer, hands which have been kissed too often by the sun are a source of annoyance. The present rage for out-of-door sports, such as croquet, lawn tennis, sailing and rowing, has played havoc with many fair hands. The sunburned hand is in harmony with the life led in summer. On returning to town and resuming laces and silks the contrast is not

pleasing. One is tempted too late to regret not having worn gloves.

Time is a certain cure for sunburn. When it is impossible to wait, there are other remedies which it may be well to try; lemon juice and glycerine mixed, or a paste made of corn starch and glycerine, or simply buttermilk. The acidity of the latter is said to remove freckles and sunburn, and the oil contained in it is beneficial and softening to the skin.

Chapped Hands.

For children, and even for many grown persons, winter is the time for chapped hands. It requires but little care to avoid the suffering which results from chapped skin. It is essential that the hands should be thoroughly dried each time they are washed, and never exposed, when moist, either to cold or to the heat of the fire.

Women who are occupied with household cares, who paint, or are engaged in similar occupations, are obliged to wash their hands frequently, and in order to save time they are often careless about drying them; the result is a rough, red skin. Never neglect to dry your hands as thoroughly as possible. They may also be manipulated before the fire until soft and flexible.

Rubbing the hands with amandine before retiring preserves them from the disastrous effects of cold or heat to which they may have been subjected. They must not be washed in cold water, as this predisposes them to chapping, but very hot water is not good for them either. People who have not moist skins should be especially careful to dry the hands thoroughly after washing. They may afterward be covered with cold-cream or amandine, which should be wiped off with a soft towel.

Where these precautions are not taken and the hands are neglected, a cure may be effected by the following treatment: Wash the hands in hot water and anoint them well with amandine, honey paste, or cold-cream. Rub the hands together, interlacing the fingers, until they become soft and are no longer easily hurt when struck against any hard substance. Afterward it will be necessary to remove the grease by washing them in warm water with a few drops of ammonia and a pure soap. Change the water several times. Then apply to the hands the following mixture: Glycerine, cologne, soft water, equal parts. After this process the hands will be soft and not at all greasy or sticky, as might be supposed.

Chilblains.

Chilblains are still more to be feared than chapping. A feeble temperament and bad nourishment are often the causes of this affection. One should walk a great deal, use the hands freely, rub the chilblain parts which are not bleeding with alcoholic preparations, and keep hands and feet very warm.

One would suppose the hands less delicate and less in need of covering than the face. However, everyone knows the necessity of protecting them from the biting cold of frost or wind.

In damp and mild winters chilblains are most painful. There are many remedies for this trouble, which is not dangerous, but the cause of great suffering, and which will deform the prettiest hands in the world.

First.—Pound the bulbs of lilies and place them in a vase containing nut oil. Apply this liniment on the sore places, and cover with a soft cloth. (This is excellent.)

Second.—Honey will cicatrize open chilblains. Anoint the parts affected, and cover with a soft white cloth.

Third.—Poultice the hands at night; rub with the following mixture in the morning: Tincture benzoin, sixty grammes; honey, thirty grammes; water, 210 grammes. Mix well.

Fourth.—Wash ulcerated chilblains with tincture of myrrh diluted with warm water.

Fifth.—Anoint cracked chilblains with Sultana pomatum, and cover with a soft, fine cloth. Cracked chilblains are difficult to cure in winter.

Care of the Nails.

The nails should be cut in a curve which follows the shape of the end of the finger. Their surface should also be polished. One hour a week spent in caring for them is sufficient to keep them in good order, if they are rubbed and cleaned carefully each day.

Never use a steel instrument in cleaning the nails, as it hardens them and causes the dust to accumulate beneath. Nothing is better than the juice of a lemon, which keeps the skin at the base from encroaching on the nail, and also prevents white spots, often caused by lack of care. Cold-cream at night, or French amandine, is excellent for softening the nails, and also prevents them from breaking off and becoming dull.

A manicure set is indispensable for the proper care of the nails. It should consist of an ordinary nail-brush, a still smaller one to go under the nail, a file, a polishing-brush, curved scissors—a pair for each hand; the nails of the right hand cannot be easily cut with scissors made for cutting the nails of the left hand.

Good Taste in Dressing.

The question of dress is one of leading importance in modern society, and the woman who affects indifference to it lacks judgment. A woman who dresses badly loses half her opportunities, that is, if the defects in her toilet are the result of her indifference on the subject. Mme. de Maintenon asserted that good taste indicated good sense.

It was also she who justly blamed women for overtrimming heavy stuffs and wearing ill-chosen ornaments. Nothing can be more ridiculous than ornaments out of place. A gown of cheap material, if well made, is often pretty, though simple and unpretentious.

Short, stout women should never wear gowns of rough, shaggy materials. Skirts made of them fall in stiff and ungraceful folds, and the bodies are equally unbecoming.

Dress fabrics in woolen goods should always be soft to the eye and to the touch. China crêpes, colored silks of medium weight, make charming costumes, and are to be preferred to the stiff silks; but a black silk gown should be of good quality, as an inferior grade does not wear well and soon grows shabby.

Beautiful feathers are durable and graceful ornaments for bonnets; cheap ones are poor economy. Low-priced finery is not worth buying. One should never economize in this way. It is never wise to buy one article of dress noticeably richer than the rest of the wardrobe. For example, a velvet dress is serviceable, but unless one can afford other costumes as elegant, it is out of place.

Mixed cotton and wool goods are usually almost worthless. One all-woolen gown is worth two of them.

Pale-blue is apt to make blondes look ashen. Dark-blue, on the contrary, is very becoming to them, and a blue velvet gown brings out all their delicate coloring. Neutral tints are very unbecoming to them. Brunettes with an inclination to be sallow will do well to avoid blue, as it makes them appear greenish or tawny. Green is trying to them unless they are very fair. It suits blondes perfectly, especially those who have color.

Pale brunettes should affect shades of red, which increase their beauty. Crimson may be worn by blondes. Yellow is a superb contrast for a pale brunette, especially under artificial light, when it is more subdued than in the sunlight. This color softens an olive skin, and borrows from it a creamy tint, harmonizing wonderfully well with dark hair and brilliant eyes. On the contrary, yellow is unbecoming to most blondes.

Concerning Æsthetics.

One must be a pretty and agreeable woman as well as a good wife and mother to keep the husband and father fond of his home. It is often possible to become pretty and agreeable by taking a little pains. Choose for the toilet colors which harmonize with the skin and hair, and wear well-fitting boots and gloves, also pretty home gowns, with sleeves arranged to show to advantage the white and rounded arm.

Do not neglect a daily walk in the fresh air. Without this wholesome exercise it is impossible to retain health and beauty. Use your intelligence to remain pretty or to become so. Add physical to moral and intellectual culture. Superintend your house and busy yourself with your children. This activity of the body, the heart, and the mind, is necessary to those who desire to remain beautiful and beloved.

The Art of Appearing Always Young.

As a charming old lady once said, "To remain always young one must be always amiable."

A melancholy face, a sullen or evil look, is like coming in contact with winter; whereas a serene face, a gracious air, a kind and good expression, are like a spring day, and a smile on the lips like its sunshine.

Sulky people, you may have remarked, always appear to be ten years older than they really are. The face grows wrinkled from contracting the brows; the mouth projects disagreeably when sulking.

Behold beside the portrait of the sullen woman the picture of a sweet and gracious woman: all her features are in repose, her lips form an adorable Cupid's bow, kindness softens her glance, and goodness illuminates her brow.

Perhaps she is the elder, but she will always appear young and charming.

Grace of Movement.

To be graceful, harmony must govern our movements.

There are women who possess in a superior degree the intuition of harmony, who select unconsciously their seats, their poses, according to the toilets which they wear. Dressed in a simple costume, they lean against a piece of furniture of severe style, or sit erect upon an oaken chair, which is in complete harmony with the appearance they present in their tailor-made gowns. In the evening, robed in silks and laces, they as naturally select luxurious sofas, ottomans, and easy-chairs, which are in perfect accord with their costumes. This is not possible for the stiff, angular woman, whose movements are brusque and awkward.

Those who know how to walk and carry themselves possess equilibrium. Perhaps this gift of nature has never been lost by acquiring bad habits, or they have reconquered it by means of study.

If you are inclined to stoop, walk to and fro with your hands behind your back when you are alone in the garden or house,

Children should be taught to throw their shoulders back by being made to walk with elbows close to the body. This will naturally keep the chin free and the chest thrown forward. The back will curve in, the shoulder-blades be kept in their places instead of projecting, the bust will arch itself, and the entire weight of the body be thrown on the hips, which is necessary for a perfect equilibrium.

One should practice touching the ground first with the ball of the foot, to avoid walking on the heels with toes in the air, which is ugly, clumsy, and ungraceful, exposing the whole system to the useless jolting Nature tried to spare us when she formed the ball of the foot.

When mounting a stairway or climbing a hill, for the sake of the lungs as well as to obtain a graceful carriage, both back and head should be held erect.

Grace of Form.

To retain your graceful form, then, learn how to carry yourself. If women would be more careful about this while young, they would have finer figures and more slender hips when older. The woman who holds herself straight, who does not draw her chin to the collar of her garment, who keeps back her shoulder-blades, and thus rounds out her bust, without an apparent effort keeps her muscles firm and flexible and the desired curve in place of flatness. Thus the heaviness which is so much dreaded, and which destroys all youthfulness and grace, may be avoided.

The woman who holds herself well, who throws the weight of her body on her hips (this cannot be too often repeated), instead of allowing it to be supported by the abdomen, has the carriage of a queen, the walk of a nymph. Do not fear that you will acquire a haughty expression. On the contrary, if your eyes are tender and your smile is amiable, your proud grace will not make you unsympathetic.

I do not mean by this that you should carry your head like a peacock, or stiffen yourself, or strut; but hold the bust in the firm and straight position which nature designed, whether you walk, or sit, or stand.

By following this advice you will stoop or lean with a thousand times more grace and flexibility than a woman who relaxes, bends, rounds her back from a mere habit of indifference.

SPECIAL DECORATIONS

The table is prepared for a special occasion and profusely decorated with flags—potted plants and vines. This answers for all Patriotic occasions. At the right is a beautiful window box and hanging basket.

TABLE DECORATIONS

A happy suggestion for the arrangement and decoration of a dinner-table for a special occasion, such as a wedding dinner. The contrast of light draperies on the walls and the green of the plants is very effective.

ATTRACTIVE HOME DECORATIONS

SOME COMMON THINGS MADE BEAUTIFUL—CHEAP AND EASY METHODS FOR HOME USE

The growing love for artistically attractive rooms, in cases where the purse does not permit free application to the upholsterer or the domestic art establishment, leads to many ingenious devices to bring beauty out of homeliness, and to produce both from cast-off and useless lumber, and material of more value, articles of ornament for parlor or chamber; while the skill in knitting, crocheting, and other arts of the fingers possessed by many ladies aids immensely in converting homely rooms into charming and attractive ones. It is proposed here to give some examples of decorations both of the homely and the more expensive order, which may serve as useful suggestions for many other articles made from materials in the possession of our readers, or in accordance with their tastes and the means at their command.

A Rustic Rug —Even such homely stuff as the coarse material of a coffee bag, or coarse sacking of any description, may be made into an attractive rug in the manner here described:

Cut the stuff to the shape required. Then, having prepared strips of woolen material half an inch wide, darn them with a coarse needle in and out through the sacking, leaving between each strip loops an inch in height. The colors of the wool may be diversified according to taste. For instance, there may be a black border, with a centre of a single shade, or of a variety of bright colors.

After the work is ended, the whole surface may be clipped evenly. A very tasty rug can be made in this simple and easy manner.

A Simple Wardrobe.—A wardrobe of attractive appearance can be made by any one of ordinary ingenuity. To do so take two boards a foot wide and five feet high. Place these the distance apart desired for the width of the wardrobe, and connect them with similar boards top and bottom, making an improvised open framework. Casters should be placed in the four bottom corners, and brass rings screwed into each end of the top board.

Next prepare a pair of curtains sufficiently wide and long, hem the top, slip a brass wire through the hem, and pass the ends of the wires through the rings, letting the curtains fall to the floor. The sideboards of the wardrobe can be stained or treated in any way desired. Finally, wardrobe hooks can be procured and screwed into the upper board.

Bookcase.—A bookcase suitable for ordinary purposes may be improvised from an old bureau which has lost its mirror, by placing above it a set of shelves, made by two upright boards screwed to the sides of the bureau, and two or three cross ones. Paint and brass handles will serve to make the old bureau look new. By screwing brass rings into the ends of the top shelf and slipping a rod through them, curtains may be hung of any stuff preferred.

Mantelpiece.—Many houses still contain the high, old-fashioned, wooden mantelpieces, painted to imitate yellow-grained black marble, and a sore affliction to the eyes. A little paint may convert an eye-sore into an ornament. Ebonize the entire surface, and paint a spray of flowers in each panel, taking care to select blossoms whose tints harmonize with the decorations of the room. In a chamber furnished with white and blue, a mantelpiece of this kind would be pretty painted white, with the panels outlined in blue. If desired, some geometrical design or figure in outline can be painted in each panel. Above the mantelpiece fasten two shelves, the upper one shorter than the lower, supporting them on brackets. In this manner a very unsightly mantel may be converted into a very pretty and attractive one.

Screen.—If your house is small and your family large, a folding-screen in each bedroom is an important addition. Very pretty and inexpensive ones may be made by covering a wooden frame with coarse canvas, and on this arranging pictures cut from illustrated papers. When the canvas is entirely covered, varnish the whole, and be happy in the knowledge that you have added a useful adjunct to your bedroom furniture, as well, perhaps, as provided hours of amusement for sick children in hunting out the various pictures.

Window Draperies.—A novel and pretty window curtain has been made easily and cheaply by the practice of a little taste and ingenuity. Its material was the yellow silk ribbon which is used to tie bundles of cigars. This was made into squares, which were joined together by bands of antique lace insertion until the full length was reached. The top and bottom were then hemmed, and the lower end ornamented with a border of white lace and a row of fringe.

Mirrors.—If through ill-fortune a looking-glass is broken, it is easy to utilize its larger fragments. These may be cut into square or diamond shape, and inserted in plush frames, or painted or gilded wooden frames. Thus utilized, a misfortune may be converted into an advantage in decoration.

Sofa Pillows.

Where there are easy-chairs, and sofas, or lounges, a beautiful sofa pillow adds much to the effect in the decoration of a room. There should be a plentiful supply of these useful articles, as they afford opportunities for ladies to exercise their ingenuity in working out beautiful designs. These vary, from the plain pillow made of denim, with cord at the edges, both for finish and for durability, to the more expensive plush and silk pillows worked with the needle. Ordinary butchers' linen may be taken, a square design of drawn work made in the centre, and a ruffle may be made around the edges of red and white taffeta ribbon in alternate rows. The back of the pillow may also be of linen.

A sofa pillow may also be made of crimson denim, with dark blue fleur-de-lis embroidered upon it in dark blue silk, which may be finished with a crimson cord. The back should be made of dark blue denim. This cover describes one which would answer for a Pennsylvania University. Other colors may be used to represent any other college. Inexpensive sofa pillows may also be made of huck toweling embroidered in wash silks in white, pink, light green, light and dark yellow, and black. A ruffle may be added of bright red silk, and the back of the pillow made of toweling. A very inexpensive sofa pillow may be made of squares of silk, ribbon and velvet, each square slightly padded to give a raised effect. The edges of the pillow may be finished with narrow ruffles or silk cord. This variety of pillows offers great opportunity for ingenuity in using remnants of silk and velvet, and they are deservedly popular.

Quite an attractive pillow may be made of white linen, on which autographs of friends or of a class may be written in lead pencil, and outlined in several shades of green embroidery silk, or any other color which suits the fancy of the designer. The pillow may be square or octagonal in shape. A dainty pillow of this kind may be filled with dried rose leaves.

Ornamentation of Bedrooms.

Where there are several bedrooms, it is not unusual to furnish each one in a color

of its own. One room, for instance, may be furnished in blue and white. The walls may be hung with satin striped paper, the draperies made of inexpensive materials, worked with ruffles and such designs as the occupant may desire, or which may please the designer. Another room may be furnished in red and another in green, and so on. The proper arrangement of the draperies of the windows adds much to the effectiveness of the decorations. The bedroom should not be overcrowded with furniture, and each article should have a place where it can always be found.

Living-Room.

Upon the decoration and furnishing of the living-room depend much of the warmth, comfort, and pleasure to be obtained from it. The old-fashioned fire-place is again coming into vogue, as the warmth and light of a good wood or coal fire add greatly to the cheer of the home. The mantelpiece and surroundings should not be receptacles for odds and ends that may be placed there by various occupants of the room, but should be tastefully decorated with a mantel clock, vases of flowers or dried grasses, and one or two ornamental articles. Overcrowding should be avoided. On each side of the mantel should be hung suitable and suggestive pictures, neatly framed, always avoiding the cheap penny pictures, which do nothing more than encumber the walls. A few choice pictures are much more to be desired than many cheap prints. Books should be arranged on shelves, or in bookcases specially prepared for them. Care should be taken that they be properly arranged in such order as may be agreed upon, whether by titles or by sizes. Window draperies for the living-room should always be bright in color and serviceable. There are several ways of hanging them; probably the most serviceable one is by rings from poles placed across the window.

The Convenient Kitchen.

The kitchen is the workshop of the home. It therefore should be furnished and arranged for the special convenience of the housewife and cook, and for the health of the occupants of the home. Plenty of light and air should be provided. At some time during the day it should have sunshine in abundance. In building a house it is more important to decide the location of the kitchen than that of the parlor. The sanitary arrangements include proper drainage, copious and clean supply of water, the best sanitary plumbing, generous room in the closets and pantries, and facilities for the proper care of cooking utensils. Kitchens should be made attractive as well as useful. This may be accomplished by giving attention to the hanging of simple curtains at the windows and over open cupboards; by the arrangement of dishes and utensils in the places where they belong; by tidiness in the furniture of the kitchen, and by general cleanliness. It is not customary to decorate the walls with pictures. The mantelpiece should have its clock and one or two suggestive ornaments.

Window Gardens.

Nothing adds so much cheer to the house as beautiful window gardens filled with flowers and potted plants. These decorations are within the reach of all, and there are many beautiful designs which will suggest themselves besides those we offer. One of the prettiest we have seen is a window garden occupying the south end of a dining-room, arranged with a wire stand in the centre. These stands are readily procured at almost any merchandise store, or they may be readily made out of light pieces of lumber in the form of steps, which, if neatly painted green or red, will be very serviceable. Window shelves may be made and covered with heavy paper or oil cloth of a neat figure. The plants may be so arranged as to give sunlight to the varieties needing it most.

Another very useful form is to make for the window garden a box, in length equal to the width of the window, six or eight inches wide and eight inches deep. The box should be lined with zinc and filled with sand or light mold. Not more than six or eight plants should be used in an ordinary window-garden box. In winter time the plants should be carefully protected at night from the frost caused by the falling of the temperature of the room. This may be

easily done by putting heavy paper between the plants and the window.

Decorations for Public and Festive Occasions.

It is desirable to decorate rooms for both public and private occasions, such as anniversary days and festal days. Decorations intended to instil patriotism are frequently used on Children's Day, Washington's Birthday and the Fourth of July. The national flag is always a prominent feature. The platform, or stage, or the part of the room to be used for the entertainment, is made the centre of the decorations. Flowers, palms and vines are always beautiful, and their arrangement depends upon the taste of the parties directing the same. It must not be overlooked that even the most common flowers and plants form the prettiest decorations. Although the farmer may fight the daisy as a nuisance in the field, yet the decorator will find that it makes one of the most beautiful decorations, either bunched together or in chains, woven around walls and furniture.

Wedding Occasions.

No wedding would be complete unless there were decorations in the parlor or church where the marriage ceremony takes place, and also of the dining-room and table where the breakfast or dinner is served. There are many happy suggestions for such occasions. It is customary to decorate the church by running arches, made of flowers and vines, over the aisle along which the bridal procession takes place. Festoons may be hung from the ceiling in artistic lines. Care should be taken that harmony in arrangement prevails, and one part is not decorated at the expense of another. Potted plants are always beautiful in decorating the platform and pulpit and for tables and window ledges. White ribbon, either in bows, or nicely looped, adds also to the effectiveness of the decorations.

Decorating the Table.

For bridal or festive occasions very simple and pretty decorations may be made by the arrangement of a few flowers on the table and good taste in arranging the china, the silver, and the linen. It should not be overlooked that too much decoration is worse than no decoration at all, and the effectiveness is often lost by carelessness in arranging one or two small items. Symmetry and harmony should not be lost sight of. The color effect should be left to persons who have "an eye for color."

Fancy Work for Leisure Hours.

In these days of household leisure taste in common art has developed, and we care much more than did our grandparents about surrounding ourselves with things of beauty. The struggle of life was harder for them, and they had little time to adorn tables and chairs, arrange artistic effects in rooms, and make windows and walls rich with color and fair with soft drapery.

Embroidery.

Among the most popular home occupations for present-day ladies may be named embroidery. The loom and the spinning-wheel, in one form or another, are as old as civilization, and our devotion to the embroidery frame is but a return to the occupation in which mediæval ladies found delight. Few of them could read or write, and the needle was their only form of expression. This is no longer the case; we are not so narrowed in our range, and yet embroidery continues to be pleasant work for a group of merry girls or thoughtful women.

The most expensive materials for this work are silk, velvet, tissue, gold and silver cloth, velveteen, and plush. Among cheaper materials are linens of various degrees of fineness, crash, sateen, sheeting, serge, and Canton flannel.

Every lady who gives her mind to it, even if her skill is not great, can improve an unattractive room by a few judicious alterations, and every young girl may learn to embroider at odd moments, and by the work of her hands transform her abode from ugliness to beauty.

Crewels are used for working on linen, serge and flannel. Tapestry wool, a thicker substance, is useful on coarse fabrics. Embroidery silk is preferred for silk, satin, or fine materials. In working with crewels,

the threads should be cut into short lengths, it being difficult to use a long thread without puckering the work.

Silk plush, the most elegant and effective material for banners, draperies, and covers, is very costly. Woolen plush is a little less costly, but is also expensive. Canton flannel, in all the rich and desirable colors, is a much cheaper material. As regards the cost of these and the other materials named, our lady readers are probably well informed.

Stitches.—Stem-stitch is not difficult. It is simply a long stitch forward, a short one backward, and then another long stitch a little in advance of the first. In working outlines, care must be taken to exactly follow the line of the pattern, and to keep the thread to the left of the needle. Some knowledge of drawing is necessary for good embroidery. Leaves and flowers or conventional designs should be nicely drawn or stamped before beginning to work. A lady is sometimes so deft with her needle that she can compose her pattern as she goes on, but this is not apt to be widely the case. The stem-stitch may be longer or shorter according to fancy, but it must be even.

Split-stitch is a variety of stem-stitch, but in bringing the needle up through the material it must be passed through the embroidery silk or crewel.

Satin-stitch is the same on both sides. The needle must be taken back each time to the point from which it started. Rope-stitch is a twisted chain-stitch; blanket-stitch is the ordinary buttonhole stitch less closely worked, and feather-stitch is a broken stitch, worked in a light airy way, to suit the convenience of the seamstress.

Drawn-work consists in drawing out threads from linen, and working designs in the drawn space or filling in with needle-work. This is pretty for tidies and for the bordering of pillow-shams, spreads, and curtains.

The embroiderer needs a smooth thimble, as a sharp one is likely to catch in her silk, a sharp and pointed pair of scissors, and a set of needles of different sizes.

Appliqué work is simply transferred work. Cut out pretty figures from damask or cretonne, or the best parts of old and worn embroideries, and fasten them securely on a foundation of lace, linen, or silk.

Things to Embroider.—In addition to curtains, lambrequins, screens, and panels, which only a few women have time for, cushions and chair-backs may be made in great variety. Sofa cushions are always desirable as gifts. A long narrow cushion for the back of an invalid's chair, a neck-rest for a rocker, covers of linen to be slipped over a chair that has lost its freshness, little round table mats, pieces to brighten the centre of a dinner-table, portfolios and letter-cases, slippers and sewing and knitting-aprons, with pockets to hold a bit of work, thimble, and needle sheath, are among the many articles that may be made in leisure hours.

Crocheting.

The little crochet hook is a very old instrument. Its charm is that with so small a tool so many beautiful things may be produced. From a counterpane to a collar, almost anything may be made with the crochet needle. Babies' afghans and sofa quilts for convalescents are often crocheted. There are few occupations more fascinating than this to those with time to spare.

Knitting.

The delight of knitting is its sociability. Embroidery demands close attention, but the knitter may talk at the same time, her fingers moving with automatic precision. What pictures rise in our mind's eye of dear old ladies knitting by the fire, their needles flashing and their voices busy with social chat! Shawls for breakfast or evening wear can be either knitted or crocheted, and many other articles at once useful and ornamental, are at the command of busy and skillful fingers in this old-fashioned art.

Decalcomanie.

Beautiful jars, vases, umbrella holders, and boxes may be made in this favorite work, for which scrap pictures are necessary. It requires taste to arrange these tastefully, and when well gummed, they should be varnished to preserve them and

to impart a finish. Choose boxes, vases, or bowls of clear, flawless glass. Cut and gum your picture very carefully on the vase, which must then be varnished. Pass a coating of gum over the inside of the vase, then, if the outside is quite dry, paint it in oil, in any color you please. Tall vases to fill with cat-tails and grasses, or to contain a potpourri inside, shedding, whenever stirred, its faint, spicy odor over the drawing-room, are very interesting decorations, and have about them an unmistakable air of antiquity: that is, if the vase be of ancient pattern, or the ornaments those of Assyrian, Egyptian, or Etruscan character.

Potpourri.

The potpourri just referred to may be made of various combinations of fragrant materials. A very agreeable one may be made by the following recipe for a rose-jar: One-half peck of rose leaves, one-half pound each of common salt, bay salt, and brown sugar; one ounce each of storax, benzoin, ground orris root, cinnamon, mace, and cloves. These should be pounded and mixed by a druggist.

To the above may be added orange and lemon verbena and other aromatic leaves. Putting these ingredients in your jar, and stirring them frequently with a wooden spoon, you can, at any time, by airing and then closing your room, fill it with a delicate perfume.

Wax Flowers.

Wax flowers are ordinarily only clumsy imitations of the lovely blossoms which adorn our gardens, or smile upon us from lurking-places in wood or wayside, yet the artist in this work is sometimes so successful as to cheat the bees and birds.

In endeavoring to learn this art do not be too easily discouraged. Practice in this, as in all things, makes perfect. You may try to make one flower and produce a result more nearly resembling another, but if you would succeed you must not let such failures stop your work.

You always have the advantage that your model is perfect. You are not required to make any improvements upon nature · you have only to imitate, and the pattern is before you in all its charming perfection of shape and tint.

Practice will fit you in time for closely reproducing nature, if the exact imitation of her work is what you are to aim at. New models are always at hand; spring and summer bring them, and the coldest winter day need not be without them blooming in window-pot or hothouse avenues.

To say there is a peculiar fascination in this art is only to express what has been realized by nearly all who have tried it. And when you have succeeded and your productions bear a close resemblance to their original copies, your home has beautiful ornaments.

Wax should be kept in a box, closely covered from dust, and in a cool place. A brush must be provided for every color, and strictly kept for that one tint. Your sable pencils may be cleaned after using for one color, and employed in another.

Always use a pair of scissors to cut out your petals, and take as your pattern the flower you wish to copy.

In purchasing, it is economy to obtain the very best wax. You will need white, cream-tinted, very pale green, smilax, tea-rose leaf, pale spring- and deep spring-green tints for wax, but at first a few colors will suffice. In paints, both in powder and cake, the waxworker should have carmine, chrome-yellow, burnt sienna, burnt umber, Prussian blue, indigo, crimson lake, violet, carmine, rose-madder, French ultramarine, flake-white, and Indian yellow; a sufficient number of tinting and sable pencils; some modeling pins, wires covered with silk for fine, and with cotton for coarse stems; a palette and palette knife; some best Bermuda arrowroot; green and white down for leaves; two sizes of wooden molds for the lily of the valley and a cutter for heliotrope, and a bar of India ink. This is a much larger outfit than the novice requires, and will only need to be obtained gradually, as the worker improves and grows more ambitious.

To take the pattern of a petal, place it on white paper, and brush it over with a tinting-brush. The form of the petal will

be left white on the paper, and may be cut out. Or the petal may be laid on a piece of paper and its pattern cut out in that way. Always cut the petals with the grain of the wax. The fingers are excellent modeling tools. A few drops of glycerine used on the hands an hour or two before working makes them soft and pliant. Do not work with brittle wax. To remove its brittleness set it awhile in a warm room, if it has been in the cold.

Flower and Fruit Molds.—To take a mold for flower or fruit, mix some very fine plaster of Paris in a bowl with water, to the thickness of cream. Pour it lightly over leaf, or fruit, or bud, which it is well to place for the purpose on a glass slab. In about ten minutes the plaster will be hardened sufficiently to lift it from the slab. Pare away with a penknife any plaster that may have run over. Let the mold stay in the sun, having removed the leaf or bud, until it has hardened. In twenty-four hours it will be ready for a coat of varnish, which must be very thin indeed.

"To take the mold of such a flower as a fuchsia or an unopened bud, oil it, pour your thick plaster into a paper form, and allow the bud to sink on its side in the plaster. Let it sink only to the centre line, leaving one-half exposed." This we are told by a teacher of experience. "Lift the mold out of the plaster before it is set too hard, scrape the rim smooth, and with the point of a penknife make two little cavities, one at the stem end, the other at the point where the four sepals of the calix fold, and carefully brush away any little particles of plaster; place this half of the mold back in the paper form, and paint the rim, the hollow, and the little cavities with sweet oil; place the bud again in the cast, and pour enough plaster over the exposed part to fill the paper form."

In order to take a wax mold from this, dip it into cold water, and pour melted wax into one-half; fit the other half to it, turn it upside down, slowly, and hold in your hand till it has hardened. On removing the mold you will have the perfect bud. If you were able before the plaster became too firm, to bore a little hole in the mold at the stem end, you can slip the wire stem through before the wax hardens.

Proceed in the same manner to make molds for fruit, using your judgment according to shape and size.

Wax flowers and fruits are very salable at fairs and bazaars, and the lady who knows how to make them well is always sure of presenting her favorite table with something which will make a fine display, and bring in a good profit when disposed of.

Phantom Leaves.

Phantom or skeleton leaves are the ghostly remnants of the leaves that have waved on the trees in summer. They are troublesome to prepare, but are very pretty when finished. Gather the leaves when they are perfect, and then lay them in a large jar, filled with water. Leave them there until they decay, when the fleshy part of the leaves can be easily detached from the framework. The translucent, thread-like form of this delicate veined work is very beautiful. Having loosened the green part, bleach the remainder by infusion in a strong solution of soda. When quite white, bouquets or wreaths may be made of different leaves in combination, which may be arranged on a dark background, or set under glass.

Autumn Leaves and Ferns.

Happy hours may be passed in gathering and pressing ferns and autumn leaves, with which to adorn the house when winter has made desolate the fields without.

Never have too many of these in one apartment, for ornament should always be subordinate, and no room should be smothered with either growing plants, or pressed leaves and ferns.

In preparing these, the brilliant maple and other leaves should be, after drying and pressing, dipped into thin wax, or varnished. When once safely prepared they may be hung about the rooms in such manner as may seem most ornamental. They can be, if desired, sewn on paper in suitable patterns, and framed under glass as winter pictures of the flown summer.

To prepare the leaves, press them immediately after gathering between old news-

papers, or, if you have it handy, large sheets of blotting-paper, on which lay a thin, smooth piece of board. Take care to change the newspaper every day until thoroughly dry. Then wax or varnish as above directed.

China Painting.

For this work procure your colors in tubes, since you will thus acquire a greater variety than you would for either oil or water-color painting. The colors most in use are black, white, gray, and several shades of red, brown, green, yellow, and purple. These may be obtained at any art-store. The tube colors are diluted with turpentine. You will require a porcelain palette, a glass slab, several camel's hair brushes of different sizes, a bottle of spirits of turpentine, one of 98 per cent. alcohol, and small bottles of oil of turpentine, oil of lavender, and balsam of copaiba. A steel palette knife, and one of horn or ivory; a rest for the hand while painting, made of a strip of wood about an inch long and twelve inches wide; a small glass muller; and a fine needle set in a handle for removing tiny particles of dust.

A plate, a flat plaque, or a tile is best to begin with, and the first design should be of the simplest. One must learn by degrees how to use the colors which will best stand the firing, which is the crucial test. There are places in the cities to which articles of painted china may be sent to be fired, few people having the facilities to do this in their homes.

Painting can be applied to china, to velvet, to satin, to cloth, and to almost every fabric and material in use among civilized peoples.

By study, careful watching of processes, attention to details, and obedience to the directions of the best manuals, one may learn to paint creditably without a master. But all arts are rendered less difficult by a painstaking teacher, and many weary hours and disappointments may be saved by joining an art class.

Amateur Photography.

To have one's picture taken was formerly a family event; now it is the work of a fraction of a minute in the photographer's chair, while the art of photography is a common amusement for leisure hours.

An amateur photographer's outfit is not very expensive, and is an exceedingly attractive and instructive possession to young and old alike. The negatives taken will be developed by any professional photographer, or may be by the amateur himself, if ingenious enough to prepare the necessary appointments and study the art. For this he must resort to works on photography.

Screens.

Our forefathers did not think their houses complete without screens. These are useful for breaking off the heat where there is an open grate, and for placing near a door often opened, to prevent a draft, and are still quite popular. Very handsome ones may be made of feathers by gumming them on a framework of gauze or other material, stretched by wire. Or card-board may be used for the background. The lad who is skillful with tools may make screens of thin wood and other light materials, a framework of strips being made and fastened together, and then covered with the material preferred. If it is to be a folding screen. the separate parts can be readily joined together with hinges.

Care of Domestic Animals and Plants.

It seems advisable to supplement what we have said about the methods of making home attractive with some consideration of other important elements of home interest, the plants and flowers which change our windows into miniature conservatories, and the singing birds and other pet animals to which we give loving care, and whose lively arts and sweet voices help to make the hours pass pleasantly. First among these it will be well to speak of the prime favorite among all the feathered tribe, the golden-plumaged and sweet voiced canary.

The Canary Bird.

No birds, except pigeons and fowls, have developed under man's care into so many varieties as the canary. The original wild bird is a finch, of greenish hue. Among

domestic birds there are several varieties fully or partly green, but yellow is the most admired tint, there being several shades of this favorite color. The canary, above all other birds, lives and thrives in a cage. It has been bred for so long a series of generations to cage-life that its native wildness has vanished, and in the open air it is quite incapable of taking care of itself. In the cage it is bred with greater ease and success than almost any other bird, and the raising of canaries is in some localities, as in the Hartz Mountains of Germany, a distinct and profitable business.

It is as a song-bird that the canary is most valued, and for many generations its powers of song have been developed in Germany until they approach perfection. The young birds are carefully trained, some by skillful older singers, some by the flageolet, until they can execute certain fine trills or passages of melody. Some songsters have the wonderful compass of four octaves, and can sing various "shakes" in marvelous style. Each burst of song should, for the best effect, end in a soft, flute-like, falling passage, an effect which it takes six months' training to produce. Many birds of excitable temperament are apt to break into loud, detached notes, which spoils their song to the ear of an adept in canary music.

The song of the canary is evidently a matter of choice and training, and the German song canary has a voice vastly more beautiful than that of the wild bird. Cock birds of fine voice are chosen to breed from and also as tutors, young birds, if possible, being trained in a room where they can hear only the tutor, for they will pick up bad notes as easily as good ones if left where they can hear them. The tutors and pupils are allowed to sing only about three hours each day, being covered up the rest of the time. Birds that have caught up bad notes need to be drafted off, before they can make mischief among the others. If there is no good tutor, a flageolet will serve, with the condition that the same air must always be played in exactly the same way.

The colors of cage birds vary considerably, through green, yellow, white, brown, gray, etc. The yellow and the white have often red eyes, and are the most tender; those most resembling the wild race—dusky green above and yellowish green beneath—are the strongest. The bird now most admired is of yellow or white body, with head, wings, and tail of a lively yellow. The golden yellow bird, with head, wings, and tail black, or dusky gray, comes next in estimation. There are other admired shades of color, those spotted or speckled being of least value.

Care of Canaries.

In keeping canaries much attention must be paid to the cage, which is very liable to be infested with the canary mite, a plague so constant that great care is needed to avoid it. It begins with a floury dust, which is soon found to be alive, the insects becoming larger and reddish in color. They harbor in the minutest crack. To destroy them, every cage should be completely plastered with whitewash and carbolic acid at the beginning and end of each breeding season, each chink being carefully filled. If any of the "flour" appears on the perch, this should be withdrawn, the place painted with oil, and a new perch with an oiled roof put in. If it is in a crack, paint it over with spirit varnish. If the case is a bad one, paint with solution of bichloride of mercury, rubbing it well into the places, and, when dried, varnish over it. In this way the enemy may be overcome.

The food of the bird is an important matter. In Germany summer rape seed, of mild quality, is chiefly used, the cocks—the only singers—having also a little bread-crumb and egg. To force them, dealers often feed them almost entirely on egg-food, and the bird, when purchased, is fed solely on canary seed, or canary and hemp seed. This sudden change is apt to prove injurious.

Canaries are liable to various disorders which need special treatment. Colds may be cured by putting twenty drops of paregoric, a bit of gum arabic the size of a pea, and half a teaspoonful of glycerine in the water. Loss of voice may be treated in the same way, but in either case it is best to give first a drop or two of castor oil from the point of a penholder.

A dirty cage or stale green food may yield its result in diarrhœa. This is best treated by oil given as above, afterwards adding gum to the fountain and sprinkling a little prepared chalk in the egg-food. If green food is properly given constipation is rare. When it occurs, a teaspoonful of glycerine, followed by one of infusion of gentian, should be added to the water.

The feet need to be examined now and then, since balls may gather upon them and cause much pain. The claws also may need to be shortened a little from time to time, being clipped with scissors.

The Mocking Bird.

Among American birds, the mocking bird stands high in public estimation. The vocal powers of this plain-plumaged favorite are extraordinary, no other species approaching it as a mimic, except its near relative, the cat bird. Its powers of imitation are wonderfully varied and perfect, and it is inclined to show them as well in captivity as in freedom. Its own song is full, bold, and exceedingly varied, and it has the faculty in its native bush of repeating the songs of all its feathered neighbors as exactly as an echo. In captivity it can be taught a long air by its master, and will imitate the quavering trill of the canary and the fluting whistle of the redbird with such fine execution as to silence these expert singers. It can imitate many less musical sounds, will whistle for the dog, squeal like a hurt chicken, bark, mew, creak like the wheelbarrow, and vary its notes endlessly. A well trained mocker is a wonder, though at times it may become an annoyance from its endless vivacity.

The natural food of the mocking bird consists of insects, fruit and berries, and a few insects or meal worms should be added to its daily diet, which may consist of what is called fig-dust—finely-grained oats mixed into a stiff dough with milk and water. Carrot and boiled potato may be given alternately, with a little egg-food. Gravel and water, of course, are needed by all birds.

Other Song Birds.

The Virginia redbird is at once beautiful in plumage and a favorite for its loud and almost constant song. It is hardy, and if properly fed is liable to few ailments. It needs to be fed with seeds, soft food, and insects. A little cuttle-fish bone should hang in the cage, and a red pepper-pod.

Others of our native birds kept as cage birds are the beautiful oriole, the merry bobolink, with its canary-like song, the handsome goldfinch, with its sweet warble, the brown thrush, and others of more or less powers of song.

Of foreign birds may be named the European starling, a handsome fellow, of beautiful black plumage speckled with a yellowish white, and with a song of great sweetness. It sings summer and winter, and can be taught to sing and whistle tunes. It needs soft food, doing well on bread and milk, with a little animal food and sweet and ripe fruit. It is fond of bathing, plenty of water being essential to its health. It must have a deep saucer of gravel or a large turf to dig its beak in, which otherwise will grow deformed.

There are several other European birds of good voice, chief among them, of course, the nightingale, which, however, does not thrive in a cage. The green linnet is a pretty fellow, and, mated with the canary, produces the finest of singing birds. Other handsome foreign birds are the Java sparrow, a quarrelsome little fellow; the Japanese robin, a good songster and ready imitator, and the beautiful South American troopial, a lovely pet with excellent powers of song.

Parrots.

Among cage birds not noted for sweetness of song, yet of high popularity, may be named the gray parrot, a familiar inmate of hundreds of households, and widely welcome for the part it takes in the conversation of the family. It is, in its way, as imitative as the mocking bird, but its vocal powers are adapted to the imitation of words instead of song notes, and its achievements in this direction are often extraordinary, especially as the uncanny bird frequently makes his words fit the occasion so closely that he seems to know well what they mean.

The domesticated parrot has no objection to the cage, often manifesting uneasiness when let out for a promenade. The

food of the gray parrot should consist of maize, oats, wheat, and bird-seeds, with occasional nuts and biscuits, and ripe fruit in its season, this being very useful and wholesome. They can be easily taught to eat potato, and bread and milk and other soft food may be freely given. They will eat meat readily, but, as it tends to produce disease, it should not be given. They should have frequent opportunities to bathe, and, if they fail to do so, should be showered in summer, now and then, with warm water from a syringe.

The Amazon parrot, a more highly-colored bird, is as good a talker as the gray. Its plumage is green over most of the body. Its food and general treatment should be as above described. Of other large parrots we may name the king parrot, a splendid red and green bird, Pennant's parrakeet, and the rosellas. These must all have the same diet of seeds and vegetable food, with fruit in the season. The beautiful king parrot, one of the quietest of these birds, breeds freely in captivity.

Parrots usually leave off screaming when they grow tame and familiar, but there are some hopeless cases, and several cockatoos together may prove worse than a brass band. The beaks of the larger parrots are also so strong that only very stout cages can stand their attacks, and bad-tempered birds need to be dealt with cautiously, as they could break or sever a finger with great ease.

As a general rule, the food of all parrots should consist of grain and seeds, especially millet, maize, or harvest grains in the ear or on the stalk. Sunflower seed is highly relished, and such green food as salad herbs, chickweed, groundsel, etc., should be given freely, with a twig from some green tree to gnaw at. Biscuits are good in moderation, as also nuts and sweet fruits.

There is a large family of small parrakeets, the so-called love-birds, of remarkable beauty of plumage, at the head of which, for beauty, hardiness, and docility, is the shell parrot of Australia. This bird breeds in captivity as readily as the canary, and, as it is very gregarious, it does best in an aviary, where numerous pairs can be let loose. For breeding it must be provided with a log, with a suitable hole made in it, its native nest being built in hollow logs. There are other varieties of parrakeets kept in captivity, but some of them are delicate and hard to keep. They can be fed on millet, maize, canary seed, and the like.

Pigeons.

There are few pets which give so little trouble to keep and rear as pigeons, owing to the fact that they bring up and feed their young until these are old enough to provide for themselves. Cage-birds, it is true, do the same, but there are many dangers and mishaps to birds grown in confinement, which the pigeon, with its outdoor exercise, escapes—except in some of the highly artificial "fancy" varieties.

In keeping pigeons, the first rule to observe is never to *crowd* the birds. If there is only a small space, one good pair of pigeons will rear more young in it than several pairs. A room with six feet square of space will accommodate about six pairs of breeding-birds,—not more. There should be fewer, unless the young are sold or eaten as they grow large. The pigeon-cote in a wall or at the top of a pole is fit for only the most common and hardy pigeons, and these if used remain wild and cannot be tamed or handled.

Pigeons must either be allowed to fly out at liberty or have a wire-enclosed space outside in which they can take exercise. A space twelve feet long and six feet wide and high will do very well. It should have shelves at the ends, affording a flight from one shelf to the other. The floor should be covered with lime and sand or some form of concrete, so that it may be easily cleaned. It needs nothing else except a vessel of water for the pigeons to bathe in. This may be three or four inches deep and two or three feet square, the water being renewed every morning.

Within the loft nesting places must be provided. A simple kind is a series of shelves across the back of the loft, with an upright partition in the middle, dividing it into two sets of shelves. Boards must be nailed down the front, leaving a central opening for the birds to each shelf space. Each length of shelf forms a breeding place for one pair of pigeons.

Perches for the birds must be fixed along the sides of the loft, as roosting places, with slanting boards beneath to catch the droppings of the birds. These can be very easily cleaned. The loft should be painted, and scrubbed at intervals with carbolic soap, or whitewashed at suitable periods with hot lime. To avoid fleas or other vermin, cover the floor with an inch of coarse pine sawdust. If the droppings be raked off every few days, this need not be renewed for several weeks.

For pigeons in confinement, the permanent staple diet should be good gray peas. In winter these may be changed to small sound tick beans. Either should be mixed with one-third of large tares, and a little good barley may be added. Beans are too hard in summer, and the diet should consist of mixed peas and wheat, with small corn. For very small pigeons small peas must be selected, with a few tares. Pigeons are very fond of hempseed, but nothing can be worse for regular food. A handful now and then is stimulating. Small seeds, like canary and millet, are much relished, and are useful for the young birds. The food should be given in some kind of a hopper, so that the birds cannot foul it with their droppings. Pigeons at liberty eat all kinds of things besides grain, such as grubs and small worms. Some will eat minced meat in confinement, and others relish boiled potato, bread and milk, etc.

There is one element of pigeon diet which must never be omitted. They have a craving for lime and salt, and will pick at old mortar. Take equal parts of old mortar pounded, sandy gravel, and loamy earth, and add to a gallon of this a half pint of cummin seed and as much coarse bay salt. Mix this with strong lime into a mortar, and keep it constantly supplied to a box, with a slit near the top into which the birds can get their heads. If their bodies could get in they would soon tread it hard. If old mortar cannot be had, old slaked lime will do, hard enough to need pounding.

Highly-bred pigeons are subject to various complaints, from which the hardier kinds are largely free. For the former a special handbook of diseases and treatment will be necessary. For the latter a simple treatment suffices. Colds will often yield to a pinch of Epsom salts and shutting the bird up in a warm pen, bathing the legs in hot water and drying every night; diarrhœa, to a few drops of chlorodyne. Wing disease is somewhat frequent in confined birds, hard yellowish lumps showing on the joints of the wings. These should be painted daily with spirits of turpentine or tincture of iodine, or rubbed with iodine ointment.

Rabbits.

The rabbit is a boy's favorite, needing, of course, much more space than a bird. It can be best kept in a dry shed, ventilated at top only, and well lighted. The floors are usually of earth, but are better if made of concrete or paving stones, for convenience in keeping clean. Even a rough shed open at the front is much better than none at all, or a large door or shutter fixed over a couple of hutches. The rabbit will not thrive without light, and it is very susceptible to bad weather, being subject to "snuffles" (a kind of influenza) and other disorders.

A breeding hutch should not be less than three feet long and eighteen inches wide, with a partition a foot from one end, to make a sleeping chamber. Near this must be a round hole, for the doe to pass in and out, with a sliding shutter to close it. Rabbits are very prolific, having usually eight or ten young four times a year. These should not be taken from their parents till they are six weeks old.

The rabbit is easily kept, feeding on grass, hay, vegetable food, fruit, scraps of bread, and almost any fresh vegetable matter. The cuttings and clippings of the kitchen are welcome to the hutch. It is easy, however, to give too much food, and wrong to give it wet. Some kind of grain or seed is the basis of sound rabbit food, oats being the best. It is wise to give only a little food at a time, and keep the rabbits rather hungry. Overfeeding is bad.

In addition to the common rabbit, there are many fancy breeds, among them the Lop-eared, the Horn, the Angora, and the Maltese. Some of these are very odd-looking, but none of them are as handsome as the pure white, pink-eyed breed.

Hyacinths and Tulips.

The hyacinth is an easily-cultivated plant, of which more than a thousand varieties are grown in Holland, forming an important item of that country's export trade. All Europe and the United States are supplied with bulbs from this source. These should be set out in October or November, the finer sorts in beds, the common kinds as border plants. They will bloom in April, and may be kept in bloom for nearly a month. No watering is needed, but they must be kept free from weeds and supported with small sticks as they increase in height. They form a rich garden ornament, varying through every shade of red down to white, from blue to almost black, while some few are of yellow color.

The brilliant tulip is also a plant largely grown and yielding many varieties in Holland, in which land it has been famous for centuries. The bulbs should be planted in October or November, being set about four inches deep and four to six inches apart. They need a protective covering in case of severe frosts. They bloom in early spring, making a brilliant display with their gay and rich hues. There are both early and late bloomers, so that a tulip border may be kept in fine appearance for a considerable period. They succeed well in ordinary garden soil, and, with the hyacinth, make a very showy spring floral display. After the period of bloom, they can be taken up and stored until autumn, other plants taking their places.

Pansies.

The heart's-ease, or pansy, is a favorite with every one, from its beauty of color and the great variation alike in the form and tint of its flowers. These make their appearance early in the spring, and will continue to bloom till the time of frost comes again. They reach their finest bloom in May and June, wilt somewhat under the summer sun, but regain their beauty in autumn.

In planting pansies, a spot with a north aspect should be chosen. Soil of medium texture and not overfertilized is best. The soil should be kept loose around them, and care be taken to see that the border is free from the wireworm. By setting out the plants in September they become well bedded before winter, and seem to do as well as those kept in frames. Their propagation is easy, and young plants can be depended upon for the following season's beds. Seeds, if saved, should be taken only from choice flowers; in this way alone can improved varieties be obtained.

Verbenas and Petunias.

The verbena is a South American plant, which will bloom with us, in the open air, from May to November, its brilliant scarlet flowers having no superior for rich show. Endless varieties have been produced by cultivation, their tints running through every shade except blue and yellow. There are every shade of red, scarlet, crimson, purple, rose, etc.; also scarlet and purple, white with red eye, and various other pretty combinations.

The plant is a creeper, taking root freely wherever the stems come into contact with the ground. It is difficult to keep it through the winter, except in the house or conservatory, none of the roots being quite hardy enough to stand the wintry chill. Yet it continues to bloom after frost, and is one of the last lingering flowers of the fall. It can be easily reproduced from plants to be had at any greenhouse, and also from seed, which, if sown in May, will yield bloom in August. No plant surpasses the verbena for mass effect, when grown in beds cut out on lawns, where the brilliant flowers contrast finely with the green grass.

The petunia is another plant which blooms throughout the entire season, even after severe frosts. A bed of petunias will be profuse in flowers, varying widely in color and markings; some single, others double, occasionally as large and full as a rose. There are three classes, the grandiflora, the small-flowered, and the double, the small-flowered being the most common. It is the latter that add so much to the beauty of our gardens by their great variety of hue.

The Lily and Rose.

Of the lily there are numerous widely-varied species, many of them well known, many others rarely seen in gardens. It

grows from a bulb, and will do well in any well-protected bed. To develop it in perfection the soil should be dug to a depth of a foot and a half, filled to a foot with swamp muck and leaf mold or fresh manure, and the hole filled with six inches of peat and rich mold. The bulbs should be planted four or five inches deep, or, of the weaker sorts, three or four inches. Most of the species are quite hardy, but it is advantageous to cover them with a deep compost before winter.

The cultivation of the rose needs no special directions. The plants, once rooted, last for years, and bloom freely with little cultivation; some once only in the season, others continually. They are nearly all hardy, though many require some degree of winter protection.

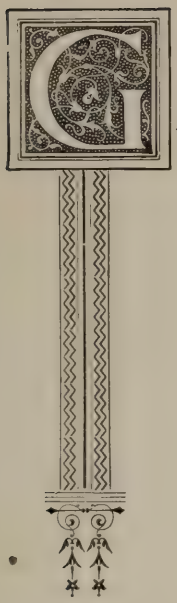
North America has furnished our gardens with various handsome flowers, among them the large and beautiful dahlia, whose very numerous varieties, more than two thousand in all, have been derived by cultivation from two species of Mexican plants. The neat grace and perfection of their floral forms and great variety of shades of scarlet, crimson, purple, red and yellow, give them a special adaptation to floral borders, where they lift their trim heads with an air of pride. No plants surpass these in their inclination to sport into new varieties. The dahlias are generally cultivated by the division of the tuberous roots. These will not bear the frosts of northern climates, and must be taken up as soon as frost blackens the tops and kept for winter in a dry and sufficiently warm place.

Another handsome garden plant of North American origin is the familiar and favorite phlox, which bears its flowers in terminal panicles. The original form, once much grown in our gardens, is now rarely met with, the showy phloxes of to-day being all hybridized varieties, the production of the florists. They are highly ornamental in character. One species, the *drummondii*, has sported into a variety of beautiful colors, and is one of the most showy of cultivated annuals.

Among the wild flowers of the United States the most magnificent when in bloom is the rhododendron, which forms impenetrable thickets in many parts of the Alleghanies, and, with its related plant, the mountain laurel, gives a wonderful charm in the floral season to the Appalachian mountain glens, from Maine to Georgia. The cultivated rhododendron is produced by hybridization between the American and several Asiatic species,. In the hands of the florist it has attained a wonderful exuberance of form and color, the highly-cultivated varieties being unequaled for richness of hue and showiness and profusion of petals. It is a hardy plant, and will winter out of doors, calling for no special care or cultivation. This, of course, does not apply to the floral monstrosities annually exhibited, as results of the exaggerated care of flower fanciers.

We have named here only a few of the better known of an innumerable variety of flowers, very many of which are adapted for house cultivation or garden growth; but, as their treatment does not vary greatly, and in special cases must be learned largely by experience, we shall say no more here upon this attractive subject.

BOOK VI



GAMES AMUSEMENTS AND SPORTS

FOR INDOORS AND OUT

INDOOR GAMES OF SKILL. Billiards and Pool, Puff and Dart, Jackstraws, The Cudgel Game, Archery, Etc.

GAMES AND TRICKS TO STIMULATE THE IMAGINATION. The German Dwarf, Head, Body and Legs, Fright, the Clairvoyant, Magical Music, Pulling Ribbon from the Mouth, the Magical Hat, Blind Man's Buff, Etc.

GAMES AND PASTIMES TO STRENGTHEN THE INTELLECT. Chess, Checkers, Backgammon, Drafts, Word Games, Consequences, Forfeits, Characteristics, Charades, Tableaux, Living Pictures, Card Games, Literary Societies.

OUTDOOR GAMES AND PLEASURES FOR ALL. Cricket, Baseball, Tennis, Football, Golf, Hockey, Polo, Lacrosse, Curling, Foot Racing, Walking, Jumping, Hammer Throwing, Jingling, Sling the Monkey, Tag, Tug-of-War, Etc.

GAMES, AMUSEMENTS AND SPORTS

FOR INDOORS AND OUT

HOW THEY ARE PLAYED—THE POPULARITY OF EACH—EMBRACING MANY GAMES, NEW AND OLD, OF SKILL, ENTERTAINMENT, FOR MENTAL CULTURE, ETC., ETC.

VALUE OF AMUSEMENTS

AMUSEMENTS serve important purposes in the economy of human life and produce important effects both upon happiness and character. Like the wells of the desert they are the resting and refreshing places in which toil may relax, the weary spirit recover its tone, the desponding mind reassume its strength and its hope. They are, in another view, of some importance to the very dignity of individual character. In everything we call amusements there is some display of taste and imagination; and by affording innocent pastime they have the tendency to preserve the character in a healthy condition. The old Puritan idea of austere seriousness was as harmful as the other extreme of unrestrained license. Both are destructive of happiness and injurious to character. Therefore, don't be afraid of a little fun at home. Young people must have fun and relaxation, and if they do not find it in their own homes it will be sought at other, and, perhaps, dangerous places. Therefore, let the fire burn brightly at night and make the home-nest delightful, with a hundred innocent pleasures and pastimes that thoughtful parents can devise, and this book will help them to provide. Don't repress the natural bouyant spirit of young people. Half an hour of merriment is also good for the old. Let it come as many winter evenings and summer days as possible. It blots out the remembrance of many a care and annoyance of the day that is ending, and its memory will be one of the most pleasant heirlooms the children will carry with them into the outer world from the old domestic nest, to enhance the meaning of those words "Home, Sweet Home" in after years.—SHEPPARD

FOOTBALL.

BASEBALL is considered the American national game and it is also *the professional* game backed by stock companies and played by hired professionals representing the leading American cities. But football has become the recognized College game of contest for physical prowess between the leading institutions of learning, and as such it is more popular, perhaps, than any other College game in history.

Football is one of the oldest of English games, and seems to have been very popular as early as the fourteenth century, though how it was played then we do not know, except that it was very different from the modern game. Town was then matched against town, village against village, and all the able-bodied inhabitants took part. The goals were often miles apart, and consisted of natural objects, such

as brooks, bridges, etc. The ball was kicked or carried at will, and little science or skill was expected of the players.

Modern football is a very different affair, one governed by intricate rules and regulations, and needing the utmost skill and alertness in the players. There are two systems in England, the comparatively simple Association game, played with a round ball, and with only sixteen rules in its code of laws; and the intricate Rugby Union game, played with an oblong ball, and with fifty rules of play.

The American game, brought to this country in 1876, is a development of the Rugby game, though it bears many points of resemblance to the Association game of England. In addition, it has developed various rules of its own, and is now a far more clearly defined and scientific game than it was originally. In its quarter century and more of existence it has developed into a sport of matchless character as regards the skill, agility, strength, and intelligence demanded, and the inter-collegiate game of to-day is unequaled as an athletic exercise.

The field on which football is played consists of a rectangular space 330 feet long and 160 feet wide, the boundaries being marked by heavy white lines traced in lime upon the ground. Usually the field is marked with cross lines at every five yards, to aid in determining the position of the ball at each *down*. The two end lines are termed the *goal lines*, the side lines are the *touch* or *bounds*, and the corner spaces beyond the touch and goal lines, are termed *touch in goal*. The actual *goals* are placed in the middle part of the goal lines, and are indicated by two upright posts over 20 feet high and 18½ feet apart, joined by a cross-bar 10 feet from the ground.

A ball that crosses the goal line is said to be *In Goal;* if it crosses a side line it is *Out of Bounds;* if it enters the angular spaces at the corners of the field it is in *Touch in Goal.*

The ball is of oblong shape, the regulation size being about 12 inches long by 9 inches wide. It is made of India-rubber or an ox-bladder, covered with pig-skin or other leather, inflated with air under pressure.

The game is played by two teams of eleven men each, and is divided into *halves*, each side having 35 minutes play, with an intermission of 10 minutes. The frequent roughness of the game demands a protective dress, which is provided by thickly-padded trousers, shin-guards, etc., the shoes having leather cross-pieces on the soles to prevent slipping.

Each man on the field has his alloted place. On taking the field the players "line up" as follows: In front, on each side, is a *rush line* of seven men, whose positions are termed *centre*, *right guard*, *right tackle*, and *right end*, and *left guard*, *left tackle*, and *left end*. Close behind the *centre* stands the *quarter-back*, farther in the rear, on either side, the two *half-backs*, and ten or twelve yards behind these the *full-back* or *goal tender*. The two sides face each other in the centre of the field, with a short distance between them. There are besides a referee, an umpire, and a linesman, to decide on disputed points in the game.

The purpose of the game is to force the ball through or over the opponents' goal, this being achieved by kicking, by running with the ball, by dribbling or working it along with the feet, or by any means other than throwing it forward—it may be thrown to the side or backward. The opposing side seeks to prevent the forward movement of the ball and reverse its motion, by catching it when in the air, by preventing kicks, by "tackling" the holder of the ball and stopping a run, and by almost any means short of a violent assault with fists or feet, tripping, throttling, etc.

The side that wins the first toss begins the game by a "kick off" from the exact centre of the field. Instantly the rush line plunges forward with the hope of aiding the ball in its progress, while the opposite side seeks to return it by a kick or a run round the end of the line. A "scrimmage" occurs when the holder of the ball, checked in his career, puts it on the ground and seeks to put it in play by snapping it backward or kicking it forward.

There are numerous technical terms in the game, of which the more important may be given. A *drop kick* is made by letting

the ball fall and kicking it on the rebound ; a *punt* signifies a kick before the ball reaches the ground ; a *kick-out* is made into the field by a player who has touched the ball down in his own goal, or from his touch-in-goal. A *touch-down* is made when the ball is carried, kicked, or passed across the goal line and held either in goal or touch-in-goal. A *safety touch-down* is made when a player touches down the ball in his own goal or touch-in-goal ; a *touch-back* when the ball, having been sent across the goal line by an opponent, is touched down by a player behind his own goal.

Scoring in Football.

The scoring is as follows: A goal obtained by a touch-down counts 6 points ; a goal from a field kick, 5 points ; a touch-down beyond the goal line, but outside the goal, 4 points ; a safety touch-down, 2 points. A player is *tackled* when his opponents assail him while running with the ball ; *interference* signifies the efforts of his fellow-players to prevent a tackle ; a *down* occurs when he is fairly stopped in a run and shouts "down." Some player of his side then puts the ball down for a *scrimmage*. The ball in this case cannot be touched by the hand, and the players on each side gather into a struggling mass, each side trying to move it with their feet or to prevent their opponents from moving it. If it be snapped back from a *down* the quarter-back must be alert to seize it, and pass it to a half-back for a run.

There are various other terms in use, to signify the other positions of the ball and the players, and the game can be understood fully only by play. American football has the credit of being much rougher than that played in England, and causing more serious accidents to players. These are due to violence during a scrimmage and to the force of combined runs. When the back or half-back is running with the ball, the players of his side gather round and run with him, in a wedge-shaped mass. The opponents seek to break through the wedge and reach the runner, and to the violence of these encounters many dangerous injuries are due. This violence of play has given rise to much adverse criticism, and a game is gradually being evolved which, while demanding as much skill and activity, can be played with more safety to the contestants.

Baseball.

This is the national ball-game of the United States, as cricket is that of England. While requiring the highest athletic vigor, skill, pluck, and presence of mind, it is simple in character, and can be played by boys as well as men, by amateurs as well as professionals. The principle of baseball is, in brief, as follows : It needs a level area of fine turf, about 600 feet long by 400 broad, at one end of which is a diamond-shaped field of 90 feet square. The four corners of this constitute the *bases*. Three of these are marked by canvas bags filled with sawdust, and secured in place, and the fourth, or home base, by an iron plate or stone fixed in the ground. The grass of the field needs to be kept cut close, and the bases and the paths between them to be laid with hard, dry soil, in such a manner as to shed water.

Nine players constitute a side, one side taking the bat and the other the field, the sides changing in this alternately. The *batsman* stands at the home base, having the *pitcher* opposite him in the field, 45 feet away, and the *catcher* close behind him. A *baseman* stands near each of the bags at the 1st, 2d and 3d bases, a *short stop* between the 2d and 3d bases, and a *right*, *centre*, and *left field* at a considerable distance in the rear of the bases. Thus on the side of the fielders the whole nine are at play, while on the opposite side only one, the batsman, is engaged.

The Pitcher.—The pitcher of a base-ball nine occupies the most important position of the nine, and the one most difficult and responsible to fill. His position is within the lines of a space six feet by four. The rules require him to deliver the ball while standing in his position, and when in the act of delivering, or in making any preliminary motion to deliver the ball, he must have both feet within the lines of his position, and he cannot take a step outside the lines until the ball has left his hands. Should he do so he incurs the penalty for balking. He is allowed to deliver the ball

to the bat in any way except by an overhand throw or by any round-arm movement, as in bowling in cricket; therefore, he can send in the ball by an underhand throw, provided in so doing he swings his arm perpendicularly to the side of his body, and forward below the waist. He should bear in mind the important fact that the true art of pitching is to deceive the eyes of the batsman—that is, to send the ball in such a manner as to lead the striker to believe that it is coming just where he wants it; while in fact it may be too high or too low, too swift or too slow. If he strikes at and misses it, or fails to strike at a fair ball four times in succession, he must run for first base or will be declared out. Four unfair balls (sent below the knee or above the shoulder of the striker, or otherwise not fair) entitle the batsman to take his place on first base.

If he strikes the ball and sends it within the lines of the diamond (otherwise it is foul) he drops the bat and runs for first base, another player succeeding him at the bat. If a previous batsman occupy this base, he must also run, and so on with all occupied bases—no two players being allowed together on the same base.

THE FIELDERS.—It is the work of the fielders to prevent the striker from making a base. If a ball, driven by the bat, is caught in the air—or "on the fly"—the striker is declared *out;* and this whether the ball be foul or fair. If not caught, it must be seized and returned by a throw as quickly as possible to the shortstop or the basemen. If the runner is touched by a ball in the hands of a fieldman before he can make a base he is put out. While the pitcher is preparing to deliver a ball or the catcher to return it, the alert players at the bases may seek to steal runs. Instead of making their usual throws, the pitcher or catcher may turn and quickly send the ball to a baseman, and thus put out the runner before he can reach his goal.

When three players are put out, the inning ends; the party in the field now taking the bat and the other party occupying the field. Nine innings on each side constitute a game, which is won by the side that makes the most runs—a run being the four sides of the square, back to the home base.

To the inexperienced looker-on at a match at baseball, it may seem a comparatively easy task to run from one base to another; but base running is something that requires considerable "head-work" to excel in it. To know when to start and when to stop, to avoid hesitancy between bases, are as important essentials as fast running, pluck, and nerve. There are so many things to look out for, and so little time to judge of one's movements, that it comes to be quite an art to excel in base running. In base running the rule is—the man who hesitates is lost.

Though football has ousted baseball from its position as a college game, its popularity continues great, and there is no danger of its losing its position as the American national game. It has the advantage of being much less dangerous than its rival, while it demands quite as much skill, agility, and mental alertness.

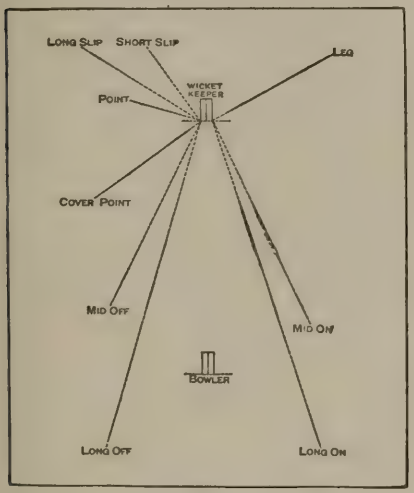
Cricket.

Cricket is the national English ball game, as baseball is the American. It is played in all lands in which Englishmen have settled, the most notable clubs in the United States being those of Philadelphia. It is played upon a level piece of turf, generally of an acre or two in extent. In a full game there are eleven players on each side, though unequal numbers of players may be engaged. There are two sets of wickets, or *stumps*, which are placed opposite each other, 22 yards apart. Each set consists of three *stumps*, or stakes, driven into the ground, 27 inches high, and set too close to let a ball pass between them. On top rest two loose *bails*, pieces of wood 4 inches long. The bat must not be more than 38 inches long, and 2½ wide in its striking portion.

Two lines are drawn on the grass near the two sets of wickets. The first, in a line with the stumps, is called the *bowling crease*. Behind this the bowler stands to deliver the ball. Four feet in front of the other wicket is the *popping crease*, within which the striker must stand. Behind this wicket stands the *wicket-keeper*. Of the

two sides, one has only two men engaged—the batsmen, who stand before the two wickets. The other side has all its men in the field in various positions.

The ball must be bowled—delivered, that is, with a round or straight-arm movement; it cannot be thrown or jerked. The object of the bowler is to hit the wicket, if possible; the duty of the batsman is to protect the wicket with his bat, and to strike and send it out over the field. The ball struck, he runs for the opposite wicket, whose batsman changes places with him. If he can do this before the ball is returned by the fielders, and the wicket struck down



by the flying ball, or by a fielder or the wicket-keeper with the ball in hand, he scores a run. If he fails he is put out. The number of runs made by either party constitutes its score, the one with the greatest number being the victor.

When a batsman is put out, another player of his side takes his place, and this continues until all but one are out. Then this side goes to the field and the other side takes the bat. Two innings to each side constitute a game. If the party of the second innings make 80 runs less than their opponents—or 60, if it be a one-day game—they must go in again on third innings, since in this case the first party has the chance to win in a single innings.

There are stringent rules. The bowler must keep one foot behind the bowling crease and must not raise his hand or arm above his shoulder in delivering the ball. An infraction of these rules constitutes a *no-ball*, and scores one to the opposite party. The same penalty is exacted if he sends a *wide ball*—one on the outside of the popping crease at the opposite wicket. The striker is considered out under the following circumstances: If either the bails be bowled off or a stump be bowled out of the ground. If the ball from the stroke of the bat or bowler's hand be caught and held before it touches the ground. If in striking, or while the ball is in play, both his feet be over the popping crease, and his wicket be put down—except his bat be grounded within it. If in striking he hit down his wicket. If while he is running, and before any part of his person or the bat in his hand be grounded over the popping crease, his wicket be struck down by a ball thrown from the field, or by the hand or arm, holding the ball, of the wicket-keeper or a fielder. If he stop the ball with any part of his person when so delivered that it would have hit the wicket. If he hit the ball twice, touch or take it up while in play, prevent it from being caught, or knock down the wicket with any part of his dress. If the ball is caught no run can be counted.

Cricket is a game requiring great skill, but more open to chance than other popular ball games. Some single misadventure may mar the fortune of a promising game, and the result is never sure until the match is played to the end. Constant practice is necessary to make a good bowler, and teach him how to vary the speed and pitch of his ball and impart a twist to its motion; and to make a successful cricketer there are needed strength, agility, and the qualities of patience, quick decision and prompt execution.

Golf.

As baseball is the national game of America, and cricket that of England, golf holds the same rank in Scotland, though it

is now largely played in other parts of the world, and has grown highly popular in the United States. It is an enjoyable amusement, and one replete with healthful exercise, while free from those spasms of violent energy and perils to life and limb which are serious drawbacks to many other games. It is played over downs or commons, *links*, in Scottish phraseology, and it rather adds to the pleasure of the game if the ground be broken by sand pits, grassy knolls or other obstructions to easy movement of the ball.

Over the golf-ground are a series of circular holes, four inches in diameter, at various distances apart (from 80 to 500 yards) generally cut on a patch of smooth turf, to aid "putting"—the gentle tapping of the ball when near the hole. The players are either two or four—two on a side. In case of four, the two parties strike the ball alternately. Each side has its own ball, and the object of the game is to drive the ball from hole to hole around the course with the fewest number of strokes, the player who "holes" the ball with the fewest strokes winning that hole. If an even number is made the hole counts for neither. The side that counts the greatest number of holes wins the game.

A variety of clubs are used, with differently curved ends, known as the *play-club*, the *driver*, the *spoon*, the *iron*, the *cleek*, the *niblick*, and the *putter* and of some of these there are several varieties. Whichever of these is best suited to strike the ball out of a difficult situation is used. These are usually carried by a *caddie* or boy. The game is started by each player striking his ball from a slight elevation at the starting-point, and cannot be touched afterwards except by a club until it reaches a hole, except to lift it when too near an opponent's ball to permit play. In this case it must be replaced in the same spot. At first the ball is struck off with a hard drive. As it approaches the hole it must be handled with gentleness and skill. No obstacle can be removed, except loose materials preventing a stroke—except on the "putting" green, or the space within 20 yards of a hole. Here the "putter" (a straight stick, with a medium-sized, flat-shaped head, weighted with lead) is used, it needing great skill to drive the ball into the small hole with a single or a very few strokes.

The contest for one hole settled in favor of one side, the next is fought for in the same way, and the game is continued until the course is finished, or until one side has won a majority of the holes. Several matches may be played on the same ground at the same time, occasionally three or more balls being used in a match, where the players choose to play singly. Disparity in skill between players is balanced by "odds," the less skillful being allowed a stroke extra to every hole, or every second or third hole, as the case may be.

Hockey.

This formerly popular, and reviving, English game, bears a close relation to shinty, a Scottish game, out of which it may have been developed. Like it, it is played with a stick curved at the end, and the purpose is to drive the ball past a goal. A hockey ground should be 100 yards long and 50 wide, the ends, as in football, being called the *goal lines*, and the field marked out by flags at the corners and on the side lines. The goals consist of two uprights twelve feet apart in the centre of each goal line, and having between them, seven feet from the ground, a horizontal bar or cord Fifteen yards in front of each goal a line twelve feet long is drawn, whose ends are curved round to the goal line by quarter circles made from the goal posts as centres. The space inclosed is called the *striking circle*, and no goal can be made unless the ball be driven between the goal posts and under the bar from a point within the circle.

The game is played by two sides, of eleven players each. It begins at the centre of the ground by what is called *bullying* the ball. Two players of opposite sides face each other, and each strikes the ground on his side of the ball, and his opponent's stick over the ball, three times alternately, after which each is at liberty to hit at the ball.

The ball once started, it must be played from right to left only, and no back-handed play, charging, kicking, collaring, shinning, or tripping is allowed, and in striking the stick must not be raised above the shoulder. The ball can be caught in the air and

stopped with any part of the body, but can be moved onward only with the hockey stick. If rolled over the side lines (or into *touch*—as in football) it may be rolled out into the field at right angles to the side line. In a well-played game, *dribbling* the ball is the most skillful play; that is, moving it along by gentle taps, following closely, and dodging opponents. A skillful player, when hard pressed, will *pass* the ball to another of his own side, and it may frequently thus be run into goal.

Hockey on the ice is an exhilarating game. There no goals are necessary, no sides chosen, no rules imposed. "All against all" is the rule, and the limits of the pond are the boundaries, the ball flying wildly at the lightest touch. A skilled skater, who can dribble the ball along cunningly, and artfully dodge his opponents, has much the best chance of winning the game. There is no more exciting sport than this.

Polo.

Polo may briefly be described as hockey on horseback. It was developed in India, and brought thence a few years ago to the western world, where it has become a great favorite with good horsemen. The game is played as above described, the horsemanship required lending it its strongest attraction. A long club is necessarily used, with a handle shaped somewhat like a mallet, and the stroke given the ball is usually a hard one, as to attempt to dribble on horseback is too difficult to be trusted to. Ponies are used rather than horses, the chief requisites being that they shall be swift, both on the run and in the turn, afraid of nothing, and obedient to the slightest movement of the rider. The principal danger in the game is in attempting to make a stroke when several ponies are together. A skillful player will follow the ball at full speed, overtake it short of the goal and by a clever back-hand stroke send it flying far backward towards his friends.

Basket Ball.

In this very popular game we have to do with an indoor amusement, adapted to men and women players alike, and affording much pleasant and healthful exercise and recreation. It doubtless had its origin in or was based upon the game of football, which it resembles in many particulars. The game is played on a prescribed space within a large room, as the floor of a hall or gymnasium, the number of players being usually five or seven on each side. At either end of the playing space a basket is suspended, at a height of about ten feet, this corresponding to the goal in football. The ball is round, somewhat smaller and lighter than an ordinary football, and is passed by the hands instead of the feet, being thrown or transferred from player to player, or struck by the hands in its flight through the air. The object of the game is to lodge it in the basket of the opposing party, this counting one point in the game.

The rules are adopted from those of football, and have to do with interference, playing out of bounds, etc. The ball is started from the centre of the prescribed space, and is advanced by vigorous efforts of the opposing sides, the struggle being often active and energetic, and affording abundant exercise, though devoid of the dangerous roughness of the corresponding outdoor game. Basket-ball has grown rapidly in popularity since 1896, especially in the East, and is now extensively played as an indoor winter amusement.

Lacrosse.

There is still another national game of ball to be described, lacrosse, the game of Canada, which is as great a favorite in that country as the other national games described are in their respective countries. The game is of Indian origin, and used formerly to be played between two tribes of Indians, the number of players being limited and the goals one or two miles apart.

The *crosse*, the instrument with which the game is played, is a straight piece of wood, about an inch thick and four feet long, bent into a semicircle at the top, with a piece of gut drawn from the top of this semicircle to a point about 18 or 20 inches from the straight end of the stick. The space between the gut and the stick is woven into a network of gut, forming a coarser and more pliable network than that of a tennis racket. The ball is rather larger

than a tennis ball, and composed of solid sponge India-rubber.

As lacrosse is played now there is no limit to the size of the field, though the goals are placed at from 100 to 150 yards apart. The goals consist of two upright posts six feet high and six feet apart, thus forming a space six feet square, through which the ball must pass to score a game. There are no minor points, and a game usually lasts ninety minutes, ends being changed at half time. Each team should number twelve players, who are stationed at suitable points from end to end of the field, in opposing couples, with the exception of a goal-keeper to each goal.

The play is begun by the two men in the centre of the field, who immediately start a struggle for the ball when "Play" is called. The one that succeeds in lifting it upon the network of his crosse runs with it, and if closely followed endeavors to pass it to one of his own side, who at once makes a sharp throw for goal. A skillful thrower, who knows just how to give the ball the fullest impetus with his crosse, is able to fling it a great distance, say 100 to 130 yards. If the ball be stopped by a player of the opposite side, play is at once resumed at a new point, and so the game goes on. If the ball passes the goal without going through, it is thrown back towards the centre of the field by the goal-keeper, and the fielders rush in to gain it. The ball may thus visit every part of the field in succession before a lucky throw carries it through the goal.

Like most ball games, there is a certain amount of danger in lacrosse, but the hurts are never serious. It can be played both in winter and summer, but a good light and a dry, even turf are decided helps.

Lawn Tennis.

Lawn tennis is an adaptation to outdoor courts of the old game of tennis, once a favorite of court and castle. It may be played wherever there is a moderate expanse of turf or smooth ground, and has grown into general appreciation with those who wish to combine healthful exercise with safety. It has the advantage also that it is adapted to men and women alike,

The game may be played by two, three, or four persons, the accessories being the balls, racquets, net, and posts. It needs for successful play a hard, smooth surface, of grass, gravel, or other material. The court is 78 feet long, and 27 feet broad if two play, or 36 feet broad for three or four players. It is divided lengthwise into two equal parts by a line, and crosswise by a net. Cross lines, called *service lines*, are drawn on each side, 21 feet from the net. These lines can be marked by white tape or other distinguishing means. The net is stretched across the centre of the court, three feet high in the middle, and a little higher at the ends, the top rope being drawn as taut as desirable.

The game is begun by a player standing on the base-line of his end of the court, who *serves* the ball, striking it with his racquet and driving it into that part of the other half of the court diagonally opposite him. His opponent returns it on the first bound, and he returns it again, striking it on the fly or on the first bound. In this way it is driven back and forth over the net, until one side fails to return it, or to drop it inside the opposite court. A failure to serve or return the ball counts 15 for the opposite side, a second failure raises the score to 30, a third to 40, and a fourth loses the game. Failure may result from missing the ball, driving it against the net, or sending it beyond the limits of the opposite court. The game, as will be seen from this description, is a very simple one. It yields, however, much entertainment and excellent exercise, and is deservedly popular.

Croquet.

The games so far described demand, some of them great strength and vigor, others much activity. A quieter game, yielding beneficial outdoor exercise, but requiring no great muscular energy or vigorous action, is that here named. It is a game suitable alike for men and women, boys and girls, one that can be played by semi-invalids or old men, and for a considerable time it was highly popular. It has now been thrown into the shade by the more active and exciting game of lawn

TWO POPULAR AND HEALTHFUL GAMES

HOCKEY, PLAYED ON THE ICE, as shown in the upper picture is a favorite sport in northern sections where there is skating; the picture shows the player as ready for the "Bully off." It is also played in the field.

BASKET BALL may be played either in-doors or out It is especially popular in the winter time for girls in gymnasiums and play-rooms. In Fall and Spring it is a fine out-door game.

tennis, which can be played on the same grounds, yet it still retains some degree of vitality.

The game of croquet is played on a smooth piece of lawn, by two or more persons, with wooden balls painted in different colors, which are driven over the ground by mallets, and made to pass through hoops of wire. It is impossible to send the ball through all the hoops in succession without a break.

Two pegs are driven into the ground at the two ends of the field, each contestant, or set of contestants, making one of these a starting and closing point. Between them are placed the hoops, ten in number. Six of these are on the line joining the pegs, two being near each peg, a few yards from the peg and from each other. Midway between them, in the centre of the ground, two hoops are placed together, crossing each other at right angles, thus increasing the difficulty of passage. On each side of the ground stand two more hoops, so placed as to make nearly a straight line with the second hoop from each peg.

The main object of the game is, starting from the peg, to drive the ball through all the hoops in orderly succession, striking the opposite peg, and returning, the course being ended by driving the ball against the starting peg. This is by no means an easy task, but one requiring a sure eye and a straight stroke, the opening of the hoops being narrow and their distance apart considerable.

The game is by no means confined to driving the balls through the hoops. Its most important feature is the method of advancing your own interests and at the same time diminishing those of your opponent by the feature known as croquetting. When a player's turn arrives, he may either play for a hoop or for his opponent's ball. If he hits the latter, he has the privilege of taking up his own ball, placing it side by side with the other and driving the latter in whatever direction he wishes. He may send it far out of position, and at the same time, if sufficiently skillful, send his own ball into position for another play at the hoops. This entitles him to another play, and if his ball goes through the proper hoop he may again play on the opponent's ball, or any ball on the ground, if there are more than two players. In the usual game of four players, two on a side, there are abundant opportunities for a skillful player to put his opponents out of position or to help his partner into a better place. This principle of croquetting adds enormously to the interest of the game and to the power of a skillful player to discomfit his antagonists, and the long continued popularity of the game was due to the opportunities for varied combinations and the exercise of skill which thus arose. At present the game is shadowed by newer claimants to favor, but is still much played by those who prefer gentle exercise to the violent activity demanded by many other games.

Quoits.

The game of quoits differs greatly from the celebrated Grecian exercise known by the same title. While the latter was mainly a test of strength, the modern game is a test of skill. The contest with Greek players was as to who could throw the quoit or disk to the greatest distance. In the modern game the purpose is to plant the quoit nearest a given spot, and needs no great strength if the distance be not great, though it may demand much skill.

The quoit scarcely needs description. It is an iron ring, flat on one side and rounded on the other, coming to a flat edge outwardly, while of some thickness on the ring border. It may be of eight inches or less in diameter. On the outer edge is a small dent, in which the end of the forefinger is placed, its use being to give a twirling or rotary motion to the quoit. This enables it to fly without wobbling in the air, and to fall in the same position in which it has been discharged.

The only other requisites to the game are a flat piece of ground long enough for the intended throw, and two *hobs* of wood or iron, which serve as the marks to be aimed at. They are driven into the ground until only about an inch of them shows above the surface.

When the sides have been chosen, the first player stands level with one of the hobs, and, taking a step forward with his

left foot (or his right foot if he is left-handed), delivers the quoit by a swinging movement of the arm from behind him to the front. The quoit must fall and remain with its convex side uppermost, either embedded in the earth or clay, or else lying flat with the concave side on the ground. If it rolls along the ground and then stops, it does not count unless the cause of its rolling was a collision with some other quoit already delivered, or unless, after having been properly thrown, it is knocked out by another afterwards played. Many players, however, count all quoits, whether they roll or not. The proper rule is that the players should follow each other in succession. In a party of four it is usual for each player to have only one quoit. When all the quoits are thrown, the score is taken by measuring the distance from the hob to the nearest part of the nearest quoit, and the side which has thrown best scores one or two, according as his one or two quoits are better than any one thrown by the other side. But every "ringer," or quoit which falls over the hob and remains with the hob enclosed within its ring, counts three; and those resting with the edge on a hob count two points. The distance between the two hobs may be any one which the players select, and the game is generally reckoned at twenty-one points.

Some skill is required to insure that the quoit, when it falls, shall cut directly into the soil, and so retain its place; and the more straight and steady its flight is, the less likely will it be to be disturbed or knocked out by a subsequent player. It is, of course, necessary to have a good eye, to judge not only of the distance to be thrown, but also of the space which remains open after the adversary's quoit has been placed in a good position. The young player will do well in practice not to stick constantly to the same limit of distance, but to change it by extending it to twenty, twenty-five, or even thirty yards, until he becomes strong enough to throw those distances without great fatigue or effort.

Bowls (Nine or Ten Pins).

The original game of bowls has been popular in Britain for many centuries, and is still much played in Scotland. The *bowling-green* is a very carefully leveled lawn of smooth turf, over which the balls are rolled. A small ball of wood or earthenware, the *jack*, is first rolled out, and serves as the mark at which all the players aim. The balls are made of lignum-vitæ, and are of a peculiar shape, between the forms of an orange and an egg. The result is that when the ball is going slowly, just before coming to rest, it curls around in a peculiar manner, and it is in the control of this motion that the skill of the players consists.

In the United States and England this old game has been succeeded by another, known as ten pins in this country, and in England as nine pins or skittles. In this game a wooden *alley*, carefully smoothed, is employed. The American alley is from 50 to 65 feet long and about 4 feet wide, and is slightly convex in the centre and beveled to the sides. At one end of this wooden pins, about a foot in height and ten in number, are set up so as to form a triangle, its apex towards the player, who stands at the other end of the alley and bowls down its surface at the pins.

The balls, usually of lignum-vitæ, are spherical in shape, and of various sizes, the players being at liberty to use large or small balls as they prefer. The purpose is to knock down as many pins as possible in three throws. If all are knocked down in a single throw, they are set up again for a second. If any remain, they must be bowled at until the three throws are made.

The highest score is thirty, made by knocking down all the pins three times in succession, a feat which it needs great skill to perform.

This is a favorite indoor amusement, the bowling alleys being usually enclosed, so that their use is not stopped by inclement weather. It is an excellent exercise for the muscles of the arms and chest, and is one of the most popular of games.

Shovel or Shuffle Board.

This game was once a national pastime in England, and was much played among fashionable people. There is a reference to it in Shakespeare's "Merry Wives of Windsor." It is now played on tables about 25

or 30 feet long and 20 inches wide. The players stand at the end of the table, each having four flat metal weights, which they alternately shove down its length. At each end of the table a line is drawn parallel with the edge and five inches from it. At the end of the game each piece which lies over this line is counted "in," and scores two points. If projecting over the end of the table, it scores three points. If no piece is "in," that nearest the line counts one point. Twenty-one points constitute a game. The object of each player is to *shuffle* his own piece in, and to drive those of his opponents off the board. The game has recently grown quite popular in this country.

Curling.

This is a game of Scottish origin, resembling shovel board, but played on the ice. In playing it flat, circular stones of from 30 to 50 pounds weight are used, each being furnished with a handle, for convenience in bowling. The *rink* is 42 yards long and 8 or 9 wide. Near its end a circle, 14 feet in diameter, is drawn. Every stone, which at the end of the game is within this circle, counts. As above, it is a constant effort of the players to drive the curling stones of opponents out of the circle and replace them with their own.

Archery.

The fashion of sport changes. Archery is doubtless the most ancient of all sports, rendered so by its long use in war and the chase. Despite the variations in public taste, and the replacement of the bow as a weapon by far more effective ones, it has still its admirers, and archery is practiced by many enthusiastic advocates. As played it may take three forms, according to the choice of the players.

Roving, the first of these, is a sort of skirmish practice. The archers wander about, shooting at any object which may take their fancy, a tree, a stray post, etc. The drawback to this method is the frequent loss of arrows.

Flight shooting is a trial of strength rather than of skill, the purpose being to see who can send an arrow to the greatest distance.

Target shooting is the usual method employed, and is much the best test of skill. The targets are set up at a distance of 60 to 100 yards, and have on them several concentric circles, the score increasing as the arrow enters an inner circle. The highest score, of course, is made when the arrow enters the *gold*, or central circle, and the winning arrow is that which is nearest the actual centre. From the times of Robin Hood down to the present day skill in sending the arrow has been in vogue, and for an interesting description of the sport we may refer the reader to the feats of the forest archer as told in "Ivanhoe," one of Sir Walter Scott's famous novels.

ATHLETIC SPORTS

Athletic sports, under which designation we class feats of pedestrianism and of hurling heavy weights, but not oarsmanship or proficiency in pastimes, were popular pursuits at schools many years before they were taken up by the universities, or before athletic clubs were formed among adults.

The usual programme of an athletic sports contest runs very much as follows: Short distance race, long distance race, one or more races at intermediate distances, a hurdle race, high jump and broad jump, with sometimes a pole jump, putting the shot, and throwing the hammer or throwing the cricket ball. This last now seldom finds place in programmes among adult athletes. The usual sprint distance is 100 yards. A mile race is almost *de rigueur*, and sometimes there is also a two or three mile race, and a steeplechase in addition, as a still further test of stamina. A quarter-mile, 600 yards, and half-mile race will also be often found for the benefit of those who can combine speed with a certain amount of stamina. Sometimes there is also a walking race.

Sprinting.

Under this head are classed races which do not exceed 440 yards. In order to prepare himself for a 100 yards race (irrespective of the training), the candidate cannot

do better than begin by steady walking exercise, at a rate of four miles an hour, of about five miles in the day, to harden his muscles; but much walking exercise should not be indulged in within a fortnight of a 100 yards race, as it has a tendency to make the knees and ankles stiff. He may run about 200 yards twice during his walk, but should only run briskly, not violently; while he is "soft" it is a great mistake to put any undue strain on the ligaments of the body. As he becomes firmer in muscle, he may reduce the distance which he runs, and cover it more rapidly, until he can run the actual 100 yards at top speed. Still, it is wise not to run the course every day at his *very* best; the squeezing the last ounce out of the powers of the body too often tells a tale, even in so short a spin. If he runs the distance with two or three yards of his best powers this will do for two days out of three. Every third day he may see what he can really do, and try for himself whereabouts in the course he had best make his one principal rush. A 600 yards race is not frequently run at a uniform pace; there is some space which the runner covers at greater speed than any other. The runner should practice starts, which are all-important in a short spin. He should stand thus: one foot (left for choice), about his own length and three inches more in front of its fellow, the body leaning very slightly forward, and the weight on the fore foot.

Quarter-Mile Race.

This is about the severest course which can be run; it requires both pace and stamina. The competitor should practice walking exercise in the same way as for shorter distance preparations, but he should run the racing distance only once a day, and not run the full distance at first; 250 yards will do to begin with, and this he can increase as he gets fitter till he reaches full distance. He should not run himself quite out more than twice a week, and should not do the whole course at full pace within three or four days of his race; during the last day or two starts of 50 yards, and spins of 120, will suffice to keep him in trim. For a half-mile he should prepare himself in much the same way, but should double the preparatory and practice distances, beginning at 500 yards early in training.

Mile Racing.

For this more preparatory walking exercise is wanted, and the mile should be run daily at first, but to commence with the pace should be little more than a jog, at about two-thirds of the runner's real powers. The speed may be increased as practice progresses, but the full distance should not be run out to the last gasp more than once a week, and not at all within four or five days, or even a week, of the race. The same for two miles, only that a still longer rest is needed between the last trial at full speed and the day of the race.

Hurdle Racing.

This class of race is too much reduced to a sort of "sleight-of-toe" among grown athletes. The distance and jumps are usually uniform—120 yards and ten flights of hurdles, three feet six inches high, and ten yards apart. The runner practices his step for these, and would be quite thrown out if the distance between the flights or their height were suddenly varied unknown to him. With growing boys there is less likelihood of the science of taking the hurdles in the stride becoming so studied, for their stride and strength are daily varying with growth. The athlete may prepare himself as to exercise in the same way as for 100 yards racing, and similarly practice starts. For a steeplechase the runner should combine the jumping practice of hurdle-racing with the preparation for long-distance running.

Jumping.

This is a feat which has greatly progressed with practice of late years. A quarter of a century ago any one who could jump five feet was looked upon as a wonder; and four feet eight inches often won a college or public school competition. Now those who have a specialty for it practice it so much that they soon add a foot or two to their range. The competitor requires to get himself as light as he can, and to avoid all heavy work with arms and back which may develop muscle where not wanted for jumping. The less lumber he carries the higher

he will jump. He should practice daily, but never tire himself. The amount of run he takes to a high jump is very much a matter of taste, but a dozen steps usually suffice. To time the *take off* is the great art, and the distance for taking off should be half the height of the jump, in front of the bar. The legs should be tucked well up, and the whole body thrown forward with just sufficient force to clear the bar, but all the rest of the power should be expended on the upward spring.

Two upright deals, with nails driven in, and holes bored to admit pegs, half an inch apart, with a light cross-bar laid on them, are all the apparatus needed for practice; the height jumped should be measured, and a piece of paper may be laid down to mark the take off, until the eye gets used to the distance. The starting off and landing should both be from the toes. The jumper should be running at full speed when he takes his spring, as he thus gets the greatest possible impetus.

Throwing the Hammer.

This sport is Caledonian in origin. The regulation hammer is 16 lbs., and handle three feet six inches long; but boys require a lighter one. The most effective way of throwing is to swing the hammer round the body twice, the arms fully extended, and with a run, swaying the whole body with it in the last half turn, then letting it go. The requisites are: 1. To let go in the right direction; 2. Not to lift the head of the hammer higher than the hands in the swing; 3. To time the step to the *take off*. It is a dangerous feat to be practised by a tyro within range of spectators; he may let the hammer go at the wrong moment, and in the wrong direction. Seven feet is the regulation run. Plenty of dumb-bell exercise helps to harden the muscles of arms, shoulders, and neck for this feat, and for the next one mentioned.

Putting the Weight.

Sixteen pounds is the full-size shot for this feat, but young boys require a lighter one. The regulation run is seven feet, and the feet should not pass the *scratch* at or after delivery. The *put* must be with *one* hand (the right, as we presume the student to be right-handed). The putter stands on his right foot, with his right shoulder thrown back, and the weight on his right hand close to the shoulder. The left arm and leg are usually thrown forward to balance the body. Two hops are then taken on the right leg; at the end of the second hop the left leg touches the ground, but the right shoulder is still kept back, and the weight of the body is still on the right leg. A spring is then taken, and the body swung rapidly round a half turn, so that when the weight leaves the hand the right shoulder and leg are forward, and the left shoulder and leg behind. The object it will thus be seen is to propel the weight by the swing of the body, and as little as possible by the arm. The body must be stopped after the weight leaves the hand, for if the line is crossed it is *no put*, although it counts as a *try*.

Throwing the Cricket or Base Ball.

Hardly a schoolboy is unable to *shy*, yet the strongest arm is not always the most propelling for a throw. The secret of throwing is to keep shoulder, elbow, and wrist joints all loose when the arm is drawn back; then to hurl out the arm, to let all three joints straighten simultaneously, and to let the missile quit the grasp at that juncture. If any one joint straightens before the other, or the delivery is not timed to coincide with the triple straightening, power is lost. A run adds impetus to the throw.

Walking.

Boys seldom have walking races. The gait of a walking race is ungainly, and is more exhausting than a run of greater speed. The walker ties himself down to an action of limb which abandons all spring and impetus. In a run he flies through the air between the touch of alternate feet on the ground, and takes off with a spring from a bent knee. In a walk he must progress "heel and toe." The heel must touch the ground first, and one foot must always be on the ground, else the gait becomes a run. The knee must be straight when the foot is put down and taken up. The chief art in walking is to "twist the hips." By twisting them at each step the stride is lengthened

and the leg carried forward by the swing of the loins, to the relief of the ordinary muscles which extend the leg

Training.

Boys do not require the severe training for feats of speed or endurance which is requisite for older persons. They have not the same tendency to accumulate internal fat, and are less disposed to lose their *wind*. Nevertheless, they can improve their powers by hardening their muscles, and this they do with good food and exercise of the required muscles. The standard maxim of training is that work trains, diet keeps the body up to the work. Diet alone will not train. It will suffice if boys are well fed on good roast joints or broiled meat (pork and veal barred), with a modicum of poultry or fish to vary the bill of fare, and plain puddings now and then. Jam and pastry should be eschewed in training. With adults limited liquid is important, but it matters less with boys; still, they had better not drench themselves with fluid, even though it be only water; and just before a race the less they drink on the day the better, so long as they do not parch themselves thereby. They should have plenty of green vegetables,—spinach, asparagus, and French beans best; then cauliflower or cabbage; not peas or broad beans if they can get the other vegetables mentioned. Potatoes will do them no harm, though objected to for adults in any quantity. Fresh fruit should also be taken in moderation; also oranges, and a dried fig or two at dinner. The great desiderata are exercise and sleep; of the latter at least nine hours, and with plenty of ventilation in the bedroom. Boys should not take exercise to any extent on very empty stomachs, before breakfast; they should keep the pores of the skin open with a daily cold bath and free use of rough towels. Exercise should be taken in flannel, which should be changed when the work is over, and the body should be well wrapped up the moment exercise is suspended; sweating does no harm, but a chill may be fatal. Boys do not need great reduction in weight, and it is better not to take exercise in heavy clothing for the sake of sweating off fat; they have little or no fat to get rid of. A boy should have fresh meat at least twice, and even thrice, a day; better three lighter meals of meat than two heavy gorges of it. Eggs may be taken, but not more than four or five in the week, less they produce biliousness; and they should not be hard boiled. If the weather be sultry, more fluid to a half-pint may be taken at dinner, or lunch, or supper, but it had better be water or beef-tea, or water with a spoonful of lime-juice. At breakfast, not more than two cups of tea, which is better than coffee, and should not be too strong.

Other Forms of Exercise.

We have, in the above, by no means exhausted the list of athletic exercises. There are numerous other forms, such as riding, swimming, skating, cycling, rowing, wrestling, boxing, and gymnastics in their numerous varieties. We might go into long descriptions of each of these, but fear that we should be consuming space without profit to our readers. One cannot, for instance, learn to ride, to skate, to row, etc., by book directions, but must do so on the horse, in the boat, or on the ice. In other words, these are exercises in which practice makes perfect, and which are to be acquired by observation and enterprise rather than by precept. There is a training required, but that will come best from the suggestions of comrades in the exercise, and the use of the eyes and the mind as well as the hands. For the above reasons we desist from offering rules for the varied athletic exercises above named, but may say something about the latest and one of the most popular among them, the use of the bicycle.

Cycling.

The bicycle is of recent invention. From the boneshaker of 1862, a stiff and fearful affair to bestride, it progressed rapidly to the "perfect machine" of 1872, a lofty wheel lifting the rider from four to five feet in the air, and giving him a frightful "header" when a stone was encountered. In 1885 the "Safety" first made its appearance, and in the years that followed the tall wheels utterly vanished, the low ones proving capable of greater speed and

yielding much more security. Since then invention has succeeded invention, and the bicycle of to-day is a marvel of strength, comfort and speed.

We do not propose to tell how to ride a bicycle. That must be learned through practice and the aid of experienced friends. It will suffice to say that the most difficult thing to learn is how to mount, and the next how to dismount—with safety, we mean; many tyros dismount with more rapidity than comfort. To propel the wheel when once seated is the easiest part of the task. There is nothing that looks easier than to see an experienced rider vault into his seat and pedal swiftly away, but such skill is rarely attained without bruises and vexation of spirit.

The rider's cares are not over when he has learned to pedal, to mount, and to dismount. There are rules of the road to learn. He must become aware of the fact that, though he cannot go too fast in a straight line, he must ease up at a corner if he wishes to go round, and must learn to lean *inwards* at curves. He will find, also, that only very skillful riders can descend hills without brakes, and it is not wise for any to attempt it. He must become familiar with traffic, and take care to observe the same rules of the road that apply to carriages, namely, to keep to the right, whether meeting or passing. He needs to carry his tools on his outings, for accidents are very likely to occur, and on a country road he should put some money in his purse, for tolls are exacted even for this very light-wheeled vehicle.

We may say something here about the records for speed made by bicycle riders, with which even the horse cannot compete. The best mile record, made by Major Taylor at Chicago, in 1899, is 1 min. 22⅘ sec. Of amateur records, the best for one mile is 1 min. 49⅗ sec. For greater distances, the best 10-mile record is 14 min. 25 sec.; 25 miles, 37 min. 02⅗ sec.; 40 miles, 59 min. 43⅖ sec.; and 50 miles, 1 hour, 22 min. 22⅘ sec. The best six days' record is 2,192 miles.

PLAYGROUND GAMES

The games of the playground vary widely in character, including many schoolboy ball games, hoop trundling, and various sports in which exercise is organized into the form of a pastime. We shall speak here only of those that take most the form of games of skill and training.

Marbles.

We shall not tell our young friends how to shoot their marbles. None of them will lack tutors in this art. Marbles are never played as a solitary exercise; a contest is always to be decided, and a penalty is usually exacted, the loser paying a forfeit in marbles to the winner.

Of the several games of marbles, probably the best is that known as ring taw. In this a piece of fairly smooth ground is chosen, on which is drawn a circle of about one foot in diameter. Six or seven feet outside this is drawn a large circle. Each player puts one or more marbles into the inner circle, placing them at about equal distances apart. From the outer circle, or *taw line*, the players shoot their marbles, or *taws*.

The opening player shoots at the marbles in the ring. If he knocks any out, he wins them, and has a second shot from the spot where his taw lies. If he fails, another player takes his place. Each player can shoot at the marbles in the ring, or at any of his opponents' taws that lie within the circles. If he hits one of these he wins a marble from its owner and has another shot; but cannot shoot again immediately at the same taw. Thus the game proceeds till the ring is cleared.

Tops.

Tops have long been favorite toys and afford much healthful recreation. There are two classes of them, the mechanical type, such as the globe and the humming tops and the old-fashioned peg and whipping tops, which can only be set in motion by the player. The latter are still the prime favorites, and the only kind with which any game can be played.

It is the peg top in particular which every schoolboy is anxious to possess and to be able to spin, and more games are played with it than with all other kinds of tops. Peg tops are pear-shaped, with an iron peg inserted at the pointed end. They are made of various kinds of wood, the best of them being made of hard boxwood.

The pegs of the tops differ very much, both in shape and size, some being short and thick, some medium; others again are long and tapering. Generally speaking, it may be said that a top with a short thick peg is likely to spin steadily—to go to sleep, as it were, while spinning; whereas the top with a long thin peg travels about a good deal, and is very active in its movements. These characteristics will be found to be more or less developed according to the shortness or length of the peg.

To spin a peg top successfully is not to be come at by chance; it must be patiently practiced, and then only will the player be able to make a top spin as he may wish. The following remarks are, however, given for the guidance of novices, as carrying out these instructions is essential to spin a top at all. A piece of cord, varying according to the size of the top, should be procured, and to it at one end should be attached an ordinary shank or livery button; at about an inch from the other end a knot should be very tightly tied, the length beyond the knot being raveled out. The top should then be taken in the left hand, the string or cord being held in the right. The unraveled end of the string, slightly moistened, is then to be laid along the side of the top, at the point where the peg is driven into the wood.

It will be observed that the lower end of the top is marked with a coil of slight circular grooves. Round the top in these grooves the cord is to be wound over the moistened and unraveled end of the cord until the button at the other end can be placed, and held tightly between and behind the two last fingers of the right hand, and with the thumb at the same time placed on the peg. The whole toy so held is then to be lifted above the head, and thrown in a curved line smartly to the ground, the cord being retained in the hand by the button secured between the two last fingers. Just before the string finally leaves the top it should be jerked, in order that any tendency to adhere on the part of the moistened end may be counteracted. It should be stated here that it is in the peculiar manner in which this jerk is performed that given kinds of spinning are obtained; but on this subject no general instructions will be of any avail: the results of the different jerks must be noticed and acted upon.

Peg-in-the-Ring.

The preceding remarks on the peg-top having been duly studied, the game of Peg-in-the-Ring may next be proceeded with, and it will be found that it is the best of the peg-top games. It should be played as follows: A circle, about three feet in diameter, has to be drawn on the ground, and then it has to be decided who shall first cast his top into the circle or ring, and the order of the succeeding players. The first player casts his top within the ring, and whilst it continues spinning the others are at liberty to peg their tops at it, or at the top of any other player who may have in the meantime cast in. So soon as all the players have cast in their tops, the first player may remove his, and himself peg at the others, and then the second, and so on; but after the first round no more than one top may be taken up until another has been cast.

Should any player fail to spin his top when he throws it, or fail to cast it within the ring, or take the top up from the ring, except in the proper order, or should it, on ceasing to spin, lie in the ring, the top is called "dead," and either is set in the middle of the ring or left where it falls, as the case may be, for the others to peg at. Any top hopping out of the ring, while still spinning, may be taken up out of the proper order, and the owner has an additional right to peg at those tops within the ring. If a top that is dead should chance to be pegged out of the ring, it becomes alive again, and the owner may at once, without waiting his proper turn, resume his play with it.

The object of each player is either to split the tops of his companions, and thereby gain the pegs of the tops as trophies, or by striking his companions' tops beyond the

YOUNG LADIES AT BRYN MAWR COLLEGE PLAYING HOCKEY

This splendid game for developing the physique of young women was first introduced into American colleges during the Fall of 1901 where it rapidly supplanted Tennis in popular favor. A Hockey Club might be formed in every community to the great benefit of its members and the amusement of interested spectators.

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boundaries of the ring, enabling them to resume their play.

Battledore and Shuttlecock.

This is a game indulged in by adults as well as by the youngsters, but although a capital game, in that it affords good exercise and amusement, it is not so popular as once it was. Ordinarily, battledores are either made entirely of wood, or else with wooden handles and "drum" heads of parchment. A more expensive kind of battledore is made of boxwood for handle, with a strained net, like the bat used in lawn tennis. Either of the first two may be purchased for a small sum at any toy shop, and they will be found much better than home-made battledores. The shuttlecock also is better bought than made; it consists mainly of a bit of cork, in which goose-feathers of equal size have been stuck obliquely.

The object of the game when played by one player is, after having thrown the shuttlecock into the air, to keep it bounding and rebounding as long as possible by repeated strokes of the bat end of the battledore. It will be found that the shuttlecock ascends and descends with the feathers downwards and upwards respectively. When more than one player indulges in the game, the players should be stationed at equal distances round the ground, each armed with a battledore, and by the aid of the battledores a shuttlecock, or more than one if it is desired, should be kept passing round and round.

Graces or Grace Hoops.

In this game two players are each provided with a small hoop and two sticks, and the game is to throw the hoops from the sticks and to catch them again on the sticks in the same succession as the bags are thrown and caught in the game of that name.

The hoops are also sometimes thrown from both sticks, and caught on one or both, according to the wish or ability of the players; the object being not to allow the hoops to fall to the ground. This game is sometimes called by its French name, Les Grâces.

INDOOR AMUSEMENTS

We do not know who invented the great number of old-fashioned round or parlor games which have given entertainment to many generations of young people. The origin of most of them is lost in the obscurity of the past, but they are played today with all the old vim and heartiness. To these inventors the world owes a great sum of enjoyment. They have done much to break up the monotony of ordinary social intercourse, have taught people how to laugh and be merry within doors, and many an evening which would otherwise have passed in dull weariness has been enlivened and made joyful by some of these lively old games. We, therefore, give a number of the most attractive of these indoor amusements for the benefit of our readers, and shall add several games of recent invention.

Acting Proverbs.

In this game each player may take a part, or, if thought preferable, the company may divide themselves into actors and spectators. The actors then each fix upon a proverb which is to be represented by every one of them individually. There is to be no connection between them in any way. Each one in turn has simply to act before the rest of the company the proverb he has selected. The first player might, for instance, come into the room holding a cup in his hand; then, by way of acting his proverb, he might repeatedly make an appearance of attempting to drink out of the cup, but of being prevented each time by the cup slipping out of his hands, thus in dumb show illustrating the proverb, "There's many a slip between the cup and the lip." The second might come into the room rolling a ball, a footstool, or anything else that would do to represent a stone. After rolling it about for some time he takes it up and examines it with astonishment, as if something were wanting that he expected to find on it, making it, perhaps, too plainly

evident to the company that the proverb he is aiming to depict is the familiar one of "A rolling stone gathers no moss." If really good acting be thrown into this game, it may be made exceedingly interesting.

The Adjective Game.

A sheet of paper and a pencil are given to the players, upon which each is requested to write five or six adjectives. In the meantime one of the company undertakes to improvise a little story, or, which will do quite as well, is provided with some short narrative from a book.

The papers are then collected, and the story is read aloud, the reader of the same substituting for the original adjectives those supplied by the company on their papers, placing them, without any regard to sense, in the order in which they have been received.

The result will be something of this kind: "The sweet heron is a bird of a hard shape, with a transparent head and an agitated bill, set upon a hopeful neck. Its picturesque legs are put far back in its body, the feet and claws are false, and the tail very new-fangled. It is a durable distorted bird, unsophisticated in its movements, with a blind voice, and tender in its habits. In the mysterious days of falconry the places where the heron bred were counted almost shy, the bird was held to be serious game, and slight statutes were enacted for its preservation," and so on.

Consequences.

The old-fashioned game of Consequences is played in the following manner. The players are each provided with pencil and paper. Then the leader of the game requests that each shall write *one or more adjectives* at the top of his or her paper, and fold it down so as to conceal what has been written. Then each passes this paper to the right-hand neighbor, who writes on it the *name of a gentleman*, and folds and passes it onward again. Then *one or more adjectives* are written; then a *lady's name;* then *where they met;* then *what he gave her;* then *what he said to her;* then *what she said to him;* then *the consequences;* lastly *what the world said about it.*

Each time anything is written the paper must be folded and passed on. At the end, the papers are collected and read by the leader. The result is generally very absurd and amusing. It might, for instance, be something of this kind: "The *happy, energetic* (1) *Mr. Jones* (2) met the *modest* (3) *Miss Smith* (4) in *Lover's Lane* (5). He gave her a *sly glance* (6) and said to her, '*Do you love the moon?*' (7). She replied, '*Not if I know it*' (8). The consequence was *they sang a duet* (9), and the world said, '*Served them right*'" (10).

The Clairvoyant.

In this game one of the company standing outside the room is, strange to say, able to describe what is passing inside. A dialogue such as would have to be carried on between the principal players will best describe the game, and show how it is to be played:

"Do you quite remember how the room is furnished in which we are sitting?"
"I do."
"Do you remember the color of the chairs?"
"I do."
"Do you know the ornaments on the mantelpiece?"
"I do."
"And the vase of flowers?"
"I do."
"The old china in the cabinet?"
"Yes."
"The stuffed birds?"
"Yes."
"You think there is nothing in the room that has escaped your notice?"
"Nothing."
"Then please tell me what I am now touching?"
"You are touching the vase of flowers."

The vase of flowers was the only object preceded by the word "and" by the questioner, and this at once guides the clairvoyant to the proper answer. The fun of the game consists in puzzling those of the company to whom the secret is unknown.

There are other games in which similar methods are employed. In "This and That," for instance, "that" is the word suggesting the answer. The company chooses an object, and asks, "Was it the desk?" "Was it this book?" "Was it that chair?" etc. The answer "Yes" follows

the chair question. In the "Magic Answer" the word selected is to follow a question concerning something having four legs. Several questions may be followed by "Was it a rabbit?" "No;" "Was it a purse?" "Yes." Of course, other guiding words may be employed.

Twenty Questions.

This is a pastime requiring some range of information. One person chooses a word denoting some substance, object, etc., a substance being some natural material, an object some product of manufacture. The other players try to discover it by asking questions in turn, twenty being allowed. The answers are confined to "Yes" and "No," except to such questions as "Is it animal, vegetable, or mineral?" Each answer suggests a new question, such as "Is it useful or ornamental?" "Is it manufactured or natural?" etc. Much ingenuity may be shown in framing the questions, and a shrewd questioner will usually solve the problem before the twenty questions are asked.

Magical Music.

This is a game in which music is made to take a prominent part. On one of the company volunteering to leave the room, some particular article agreed upon is hidden. On being recalled, the person, ignorant of the hiding-place, must commence a diligent search, taking the piano as his guide. The loud tones will mean that he is very near the object of his search, and the soft tones that he is far from it. Another method of playing the same game is for the person who has been out of the room to try to discover on his return what the remainder of the company desire him to do. It may be to pick up something from the floor, to take off his coat, to look at himself in the glass, or anything else as absurd. The only clue afforded him of solving the riddle must be the loud or soft tones of the music.

The Magic Hats.

Though the following trick cannot exactly be designated a Round Game, it may be performed by one of the company with great success during an interval of rest from playing. The performer begins by placing his own hat, along with another which he has borrowed, on the table, crown upwards. He then requests that the sugar-basin may be produced, from which on its arrival a lump is selected and given to him. Taking it in his fingers, he promises, by some wonderful process, that he will swallow the sugar, and then, within a very short time, will let its position be under one of the two hats on the table, the company may decide which hat it shall be. It is generally suspected that a second lump of sugar will be taken from the basin, if it can be done without observation, consequently all eyes are fixed upon it. Instead of that, after swallowing the sugar the performer places the selected hat upon his own head, thus, of course, fulfilling his undertaking.

Hunt the Slipper.

This surely must be one of our oldest games, and one, no doubt, that our grandmothers and grandfathers played at when they were children. The players all seat themselves, like so many tailors, on the floor in a ring, so that their toes all meet. A slipper (the smaller the better) is then produced, and given by the person outside to one sitting in the circle, with instructions that it must be mended by a certain day. Finding it not finished at the time appointed, the pretended owner declares that he must have it as it is, and thereupon commences the hunt. How it is carried on is no doubt too well known to need further explanation.

Hunt the Ring.

The game of Hunt the Ring is perhaps better liked than Hunt the Slipper, on account of its being in the estimation of most people more convenient and manageable. Either a ring or a small key may be used for the purpose. Whichever it is, a string must be passed through it, and the ends fastened in a knot, forming thus a circular band. The company then stand in a circle, allowing the string to pass through the hands of each person, and enabling every one to slide the ring easily along from one to the other. The object of the player standing inside the circle is to stop it in its progress, which, in

most cases, he finds a rather difficult task. The game is also frequently played without any string, when every one tries, of course, to pass the ring round very rapidly, without being detected by the hunter.

Hunt the Whistle.

This game is always successful, and a source of great amusement, if only some one ignorant of the secret can be found who will volunteer to act as hunter. Such person is first requested to kneel down while some lady goes through the ceremony of conferring upon him the order of knighthood. During the process, the whistle, attached to a piece of ribbon, is pinned to the coat of the newly made knight. He is then told to rise and go in quest of the whistle, which is in the possession of one of the party. The hunt now begins, the players all trying to deceive their victim in every way imaginable, and to make him think that they are passing the whistle from one to another. On every possible occasion, of course, the whistle should be sounded, until the deluded knight has made the discovery that the object of his search is fastened to himself.

Blind Man's Buff.

A handkerchief must be tied over the eyes of some one of the party who has volunteered to be blind man; after which he is turned round three times, then let loose to catch any one he can. As soon as he has succeeded in laying hold of one of his friends, if able to say who it is he is liberated, and the handkerchief is transferred to the eyes of the newly-made captive, who in his turn becomes blind man. This position the new victim must hold until, like his predecessor, he shall succeed in catching some one, and naming correctly the person he has caught.

Shadow Buff.

This game, if well played, may be productive of much merriment. A large white sheet is first being hung securely on one side of the room, and on a table some distance behind a very bright lamp must be placed. All other lights being extinguished, one of the party takes a seat on a low stool between the lamp and the sheet, but nearer the latter than the former. One after another the company pass behind him, their shadows of course falling upon the sheet as they pass. It is much more difficult than most people would imagine to guess the original from the shadow, especially as in this game it is allowable for the players to disguise themselves to some slight extent. Gestures of any kind may be practiced, masks may be worn, false noses, or anything else of the kind, to render the work of the guesser more difficult, for this always tends very considerably to add to the general fun.

Simon Says.

In this game an imaginary Simon is the presiding genius, and the orders of no one but Simon are to be obeyed. The leader of the company generally begins by saying, "Simon says, 'Thumbs up,'" when every one must immediately obey the command of Simon or incur the penalty of paying a forfeit. Simon may then say, "Wink your left eye," "Blow your nose," "Kiss your neighbor," or anything equally absurd. Whatever Simon says must be done. No command, however, not prefaced by the words "Simon says," is to be regarded. With the idea of winning forfeits, the leader will endeavor to induce the company to do certain things not authorized by Simon—indeed, the fun of the game consists in every one doing the wrong thing instead of the right one, and in having a good collection of forfeits.

How Do You Like Your Neighbor?

The company must seat themselves round the room, leaving plenty of space in the middle for passing to and fro. One person left standing then begins the game by putting the question, "How do you like your neighbor?" to any one he pleases. The answer must be either "Not at all" or "Very much." Should the reply be "Not at all," the lady or gentleman is requested to say what other two members of the company would be preferred instead as neighbors, when the new neighbors and the old must immediately change places. During the transition the questioner may endeavor to secure a seat for himself, leaving out one of the four who have been struggling for seats

to take the place of questioner. When the reply "Very much" is given, every one in the room must change places. The questioner, therefore, will easily find a seat for himself, and the person left standing must take his place as interrogator.

How, When, and Where?

In this game, as in others, a word is chosen by the company, containing as many meanings as possible, the person who has volunteered to be the questioner having previously gone out of the room. On being recalled, the person who has been out begins by asking each of his friends how they like it.

Supposing the word "cord" to have been chosen, the first player might answer *slight*, the next *sweet*, meaning *chord*, the next *loud*, the next *strong*. and so on until all have said *how* they liked it. The questioner then recommences his interrogations at the first player by inquiring "*When* do you like it?" Replies to this question something like the following may be given:—"When I am preparing to take a journey;" "When I am in church;" "When I am driving;" "When I feel musical." Then to the last question—"Where do you like it?" the company may reply—"In a piano;" "In the garden;" "Not round my neck;" "Always at hand" etc. No doubt long before all the questions have been answered the word that has been chosen will have been discovered.

Forfeits.

These old fashioned games, of which we have given some of the best known and most popular out of a large number, are apt to be followed by a series of amusing forfeits, exacted from the losers in the game. Many young people think that the forfeits are more amusing than the games themselves, and that the best part of the evening comes when forfeit time arrives.

The person deputed to pronounce judgment on those of his friends who have to pay the forfeits may either invent something on the spur of the moment, or make use of what he has seen in a book or has stored in his memory. Originality in such cases is often the best, simply because the sentence is made to suit, or rather *not to suit* the victim; and the object of course of all these forfeit penances is to make the performers look absurd. For those players, however, who in preference to anything new still feel inclined to adopt the well-known good old-fashioned forfeits, we supply a list of as many as will meet ordinary requirements.

1. *Bite an inch off the Poker.*—This is done by holding the poker the distance of an inch from the mouth, and performing an imaginary bite.

2. *Kiss the lady you love best without any one knowing it.*—To do this the gentleman must of course kiss all the ladies present, the one he most admires taking her turn among the rest.

3. *Kneel to the wittiest, bow to the prettiest, and kiss the one you love best.*—These injunctions may, of course, be obeyed in the letter or in the spirit, just as the person redeeming the forfeit feels inclined to do.

4. *Put yourself through the keyhole.*—To do this the word "Yourself" is written upon a piece of paper, which is rolled up and passed through the keyhole.

5. *Sit upon the fire.*—The trick in this forfeit is like the last one. Upon a piece of paper the words, "The fire," are written, and then sat upon.

6. *Take one of your friends upstairs and bring him down upon a feather.*—Any one acquainted with this forfeit is sure to choose the stoutest person in the room as his companion to the higher regions. On returning to the room the redeemer of the forfeit will be provided with a soft feather, covered with down, which he will formerly present to his stout companion, obeying, therefore, the command to bring him *down* upon a feather.

7. *Kiss a book inside and outside without opening it.*—This is done by first kissing the book in the room, then taking it outside and kissing it there.

8. *Put one hand where the other cannot touch it.*—This is done by merely holding the right elbow with the left hand.

9. *Kiss the candlestick.*—Request a young lady to hold a lighted candle, and then steal a kiss from her.

10. *Laugh in one corner of the room, sing in another, cry in another, and dance in another*

11. *The German Band.*—In this charming little musical entertainment, three or four of the company can at the same time redeem their forfeits. An imaginary musical instrument is given to each one—they themselves must have no choice in the matter—and upon these instruments they must perform as best they can.

12. *The Sentence.*—A certain number of letters are given to the forfeit player, who must use each one in the order in which it is given him for the commencement of a word. All the words, when made, must then form a sentence—placing the words in their proper order exactly as the letters with which they begin were given.

13. *Kiss your own shadow.*—The most pleasant method of executing this command is to hold a lighted candle so that your shadow may fall on a

young lady's face, when you must take the opportunity of snatching a kiss.

14. *Act the dummy.*—You must do whatever any of the company wish you to perform without speaking a single word.

15. *Show the spirit of contrary.*—The idea in this imposition is the same as in the game of contrary. Whatever the player is told to do, he must do just the contrary.

16. *The deaf man.*—This cruel punishment consists in the penitent being made to stand in the middle of the room, acting the part of a deaf man. In the meantime the company invite him to do certain things, which they know will be very agreeable to him. To the first three invitations he must reply—"I am deaf; I can't hear." To the fourth invitation he must reply—"I can hear;" and however disagreeable the task may be, he must hasten to perform it. It is needless to say the company generally contrive that the last invitation shall be anything but pleasant.

17. *Make your will.*—The victim in this case is commanded to say what he will leave as a legacy to every one of his friends in the room. To one he may leave his black hair, to another his eyebrows, to another (perhaps a lady) his dress coat, to another his excellent common sense, to another his wit, and so on until every one in the room has been remembered.

18. *Spell Constantinople.*—This trick, as most people are aware, consists in calling out "No, no!" to the speller when he has got as far as the last syllable but one. Thus he begins: "C-o-n con, s-t-a-n, stan, t-i ti." Here voices are heard crying "No, no!" which interruption, unless the victim be prepared for it, may lead him to imagine that he has made a mistake.

19. *The Blind dancers.*—Among players who are not anxious to prolong the ordeal of forfeit crying any longer than is necessary, the following method of redeeming several forfeits at once may be acceptable:—Eight victims are chosen to be blindfolded, and while in this condition are requested to go through the first figure of a quadrille.

20. *The cats' concert.*—This is another method of redeeming any number of forfeits at once. The players who have their forfeits to redeem are requested to place themselves together in a group, when, at a signal from the leader, they all begin to sing any tune they like. The effect, as may well be imagined, is far from melodious or soothing.

Characteristics.

The games we have given are selected from the old-fashioned ones, many of which have been in vogue for centuries. They are largely adapted to young people, who care chiefly for lively fun and boisterous mirth. There are many other evening recreations of recent origin and quieter character, frequently based upon a wide knowledge of literature, geography, or other fields of information. We append some illustrative examples of these. In the game above named the leader reads slowly a prepared list of characteristics of noted people. If these do not lead to a knowledge of the person meant, there is another guide in the fact that the initials of the person's name are repeated in the phrases used. We give a list, which any one is welcome to add to:

LITERARY.

Happy Children Appear	H. C. Anderson
Explains Asia	Edwin Arnold
England's Bright Bard	E. B. Browning
Rustic Bard	Robert Burns
Terrible Complainer	Thomas Carlyle
Tragic Career	Thomas Chatterton
Shakepeare's Truest Critic	S. T. Coleridge
A Clever Doctor	A. Conan Doyle
Recognized Wisdom Everywhere	R. W. Emerson
Touching Humanity	Thomas Hood
Wonderfully Interesting	Washington Irving
Charming Levity	Charles Lamb
Truthful Negro Portraits	Thomas N. Page
Perished By Sea	P. B. Shelley
Her Books Sell	H. B. Stowe
Beguiling Traveler	Bayard Taylor
What Magical Talent	W. M. Thackeray
Makes Travesties	Mark Twain
Charming, Delightful Writer	C. D. Warner
Neat Parlor Writer	N. P. Willis

HISTORICAL.

Naturally Belligerent	Napoleon Bonaparte
Opposed Cavaliers	Oliver Cromwell
Ever Elegant	Edward Everett
Protested Hotly	Patrick Henry
Always Loyal	Abraham Lincoln
Marvelous Light	Martin Luther
War's Triumphant Soldier	W. T. Sherman
Noted Words	Noah Webster
Great Warrior	George Washington

MISCELLANEOUS.

Perfectly Tremendous Boaster	P. T. Barnum
Best Broadcloth	Beau Brummel
Well-Earned Glory	William E. Gladstone
Thoroughly Honest	Thomas Hughes
Hamlet's Interpreter	Henry Irving
He Made Search	H. M. Stanley

A Trip Round the World.

Geography furnishes an abundant opportunity for symbolic suggestions, which may be given in the way of questions and answers, or, more entertainingly, may be taken in character. Thus a man may enter the room wearing his hat, and keep it on until some quick guesser calls out "Manhattan." Another has thrust into his buttonhole a large fishhook covered with sand. This is evidently Sandy Hook. There may

enter a boy dressed in buff, with a halo over his head. He evidently signifies Buffalo; and the girl dressed in green, the trimming in deep points, can only be Greenpoint. A lady carrying a set of dolls dressed as boys, each bearing the name "Benny," clearly signifies Albany.

Many others might be named. A large bright-colored letter C stands for Seabright. Turkey, Little Rock, Yellowstone, and various others could be similarly indicated, as by whittling a piece of wood into the shape of an ark to signify Newark, or indicating Saxony by a bunch of bright yarns. These hints may suggest many other examples, some of them very appropriate.

A Penny for Your Thoughts.

A pleasant entertainment may be had by the simple device of asking a company to think of how many things they can find symbolized on the smallest American coin. All the apparatus needed is cents enough to go around, and cards, with pencils, for each guest, on which to write their answers. The one with the largest number of correct answers wins the game. The following is the list:

1 A messenger? One cent (sent).
2 An ancient punishment? Stripes.
3 Means of inflicting it? Lashes.
4 A piece of armor? Shield.
5 A devoted young man? Bow (beau).
6 An African fruit? Date.
7 A place of worship? Temple.
8 Part of a hill? Brow.
9 Spring flowers? Tulips.
10 Three weapons? Arrows.
11 The first American? Indian.
12 Emblem of victory? Laurel wreath.
13 An animal? Hair (hare).
14 Two sides of a vote? Eyes and nose (ayes and noes).
15 An emblem of royalty? Crown.
16 Matrimony? United State.
17 Youth and old age? Youth 18—95 old age.
18 Part of a river? Mouth.
19 Something found in a school? Pupil.
20 Part of a stove? Lid (eyelid).
21 Plenty of assurance? Cheek.
22 The cry of victory? Won (one).
23 Implements of writing? Quills.

The Dinner Table.

There are various other games in which objects are symbolized. For instance, here is a list of questions and answers applicable to the dinner table. The questions may be written on cards, and these distributed among the members of the company to see who can give the greatest number of correct answers:

MEATS.

1 A tool and a wise man. [Sausage.]
2 A famous English writer. [Lamb.]
3 A silly fellow. [Goose.]
4 The wisest, brightest and meanest of mankind. [Bacon.]
5 Timber and the herald of morning. [Woodcock.]
6 The unruly member. [Tongue.]
7 The ornamental part of the head. [Hare.]
8 A son of Noah. [Ham.]
9 An insect and a letter. [Beef.]

VEGETABLES.

10 Woman's work and dread. [Spinage.]
11 Part of a house and a letter. [Celery.]
12 Skilled, part of a needle, and to suffocate. [Artichoke.]
13 What Pharaoh saw in a dream. [Corn.]

FRUIT.

14 To waste away and Eve's temptation. [Pineapple.]
15 Four-fifths of a month and a dwelling. [Apricot.]
16 Married people. [Pears.]
17 February 22, July 4, December 25. [Dates.]

THE GUESTS.

18 A kind of linen. [Holland.]
19 Residences of civilized people. [Holmes.]
20 To agitate a weapon. [Shakespeare.]
21 Meat, what are you doing? [Browning.]
22 Brighter and smarter than the last. [Whittier.]
23 An animal's home where there is no water. [Dryden.]
24 Fiery things. [Burns.]
25 A lady's garment. [Hood.]
26 An animal and what she cannot do. [Cowper.]
27 A worker in precious metals. [Goldsmith.]
28 Very rapid. [Swift.]
29 A slang expression. [Dickens.]

The Flower Basket.

The garden and field furnish material for a set of questions similar in character to those just given. We append a list of questions and answers, which may be added to by alert members of the family:

1 My first wears my second upon her foot. [Lady's slipper.]
2 A Roman numeral. [Ivy, IV.]
3 The hour before an early tea. [Four-o'clock.]
4 The cook's delight. [Butter and Eggs.]
5 A gay and ferocious animal. [Dandelion.]

6 My first is often sought for my second. [Marigold.]
7 Farewell to a sweetheart. ["Forget-me-not."]
8 The sweetheart's reply. ["Sweet William."]
9 Its own doctor. [Self-heal.]
10 My first is as sharp as needles, my second is as soft as down. [Thistledown.]
11 My first is a country in Asia, my second is the name of a prominent New York family. [China Aster.]
12 My first is the name of a bird, my second is worn by cavalrymen. [Larkspur.]
13 A church official. [Elder.]
14 A tattered songster. [Ragged Robin.]
15 My first is sly but cannot wear my second. [Foxglove.]
16 Something to be kissed. [Tulips.]
17 My first is a weapon, my second is a place where money is coined. [Spearmint.]
18 Fragrant letters. [Sweet peas.]
19 My first is a white wood, my second is the name of a Rhenish wine. [Hollyhock.]
20 What the father said to his son in the morning. ["Johnny-jump-up!"]
21 My first is made in a dairy but is seldom served in my second. [Buttercup.]
22 My first wears my second on his head. [Coxcomb.]

Initials.

Select any name you choose, and write a number of questions which are to be answered by a phrase bearing the initials of the name selected. For example, suppose we choose the name Benjamin Hastings. The initials are B. H., and every answer is to bear these initials. Here are ten questions and answers, which are offered simply as suggestions:

1 Who are you? Benjamin Hastings.
2 Who would you prefer to be? Bret Harte.
3 Where do you live? British Honduras.
4 What do you think of the tariff? Better high.
5 What is your latest fad? Buying hats.
6 Describe your character? Bad-humored.
7 Your favorite flower? Blue hyacinth.
8 The height of your ambition? Being humorous.
9 Your chief accomplishment? Building houses.
10 Your favorite book? Black Beauty.

Progressive Initials.

As progressive games are so greatly in fashion, we give some examples devised for those who do not care for card games. A number of tables to suit the number of guests must be prepared, and may be labeled "Fruits," "Flowers," "Cities in United States," "Noted Men in American History," or otherwise, as may be preferred.

Let the "Noted Men" be the first table. In the centre of each table place about twenty assorted letters, face down. Anagram letters are preferable, because they are easily turned.

Having arranged the tables, pass to each guest a score-card, on which may be printed the subjects of the different tables, four for flowers, four for fruits, for animals, etc., by means of which places may be assigned for beginning the game.

When all are seated, the bell at the first table rings, and the game proceeds. One person turns a letter, and calls it out so that all at his table may know it. Then the first person who thinks of a noted man whose last name begins with that letter says it, and the letter is his. For instance, if W were turned, and one person should say "Washington," he would keep the W. Then in quick succession a letter is turned by each person at the table in rotation until all the letters are exhausted. The object of the game is to be the first to think of a noted man, a city, or a flower, as the case may be. When the letters are all exhausted at the first table the bell rings and the game stops. The two persons who have gained the most letters during the game progress to the next higher table, and those with the least go down, as in progressive euchre. Each person, however, keeps a record on his card of the number of letters he gets in each game, and at the end of the evening the prize is awarded to the one who holds the most letters, or to the highest two, if it is proposed to give first and second prizes.

Charades.

The entertainments so far given need little preliminary preparation. The most of them may be entered upon in response to a suggestion from any of the company, such apparatus as are needed being readily supplied. There are other amusements of a more elaborate character, and which demand more thought and preparation. Among these is the time-honored game of charades.

The acting of charades is an amusement which may always be made attractive, if there be any originality displayed in the

GOLF AN OLD GAME NOW POPULAR IN AMERICA
The illustration shows the Game at one of the most interesting points.

representations and wit in the dialogue, and it is one which most young people hail with acclamation. The preparation needing to be made in the way of dressing, scenery, etc., is much less than in the case of private theatricals, little being needed beyond a few old clothes, shawls, and hats, and a few good actors, or rather, a few clever, bright, intelligent young people, all willing to employ their best energies in contributing to the amusement of their friends. What ability they may possess as actors will soon become evident by the success or failure of the charade. The following are among the many words suitable for charade acting:

Andrew, Arrowroot, Artichoke, Bayonet, Bellman, Bondmaid, Bookworm, Bracelet, Bridewell, Brimstone, Brushwood; Cabin, Carpet, Castaway, Catacomb, Champaign, Chaplain, Checkmate, Childhood, Cowslip, Cupboard, Cutlet; Daybreak, Dovetail, Downfall, Dustman; Earings, Earshot; Farewell, Footman; Grandchild; Harebell, Handiwork, Handsome, Hardship, Helpless, Highgate, Highwayman, Homesick, Hornbook; Illwill, Indulgent, Inmate, Insight, Intent, Intimate; Jewel, Joyful; Kindred, Kneedeep; Label, Lawful, Leapyear, Lifelike, Loophole, Loveknot; Madcap, Matchless, Milkmaid, Mistake, Misunderstand, Mohair, Moment, Moonstruck; Namesake, Necklace, Nightmare, Nightshade, Ninepin, Nutmeg; Orphanage, Outside, Oxeye; Padlock, Painful, Parsonage, Penmanship, Pilgrim, Pilot, Purchase; Quicklime, Quicksand, Quickset, Quicksilver; Ragamuffin, Ringleader, Roundhead, Ruthful; Scarlet, Season, Sentinel, Sightless, Skipjack, Sluggard, Sofa, Solo, Somebody, Sparerib, Speculate, Speedwell, Spinster, Statement, Supplicate, Sweetmeat, Sweetheart; Tactic, Tartar, Tenant, Tendon, Tenor, Threshold, Ticktack, Tiresome, Toadstool, Torment, Tractable, Triplet, Tunnel; Upright, Uproar; Vampire, Vanguard; Waistcoat, Watchful, Watchman, Waterfall, Wayward, Wedding, Wedlock, Welcome, Welfare, Wilful, Willow, Workmanship; Yokemate, Youthful.

Tableaux Vivants.

In the estimation of some people tableaux vivants, or living pictures, possess even greater attractions than charades, simply for the reason that in their representation no conversational power is required. The performers have to remain perfectly silent, looking rather than speaking their thoughts; proclaiming by the attitude in which they place themselves, and by the expression of their countenances, the tale they have to tell. To others, however, this silent acting is infinitely more difficult than the incessant talk and gesticulation required in charade actors. Naturally active, and gifted with a ready flow of words, the ordeal of having to remain motionless and silent, for even three or four minutes, would be equal to the infliction upon themselves of absolute pain. Still we must not be led to think that individuals devoid of character are the most eligible to take part in tableaux vivants; no greater mistake could be made. The affair is sure to be a failure unless the actors not only have the most perfect command of feeling, but are able also to enter completely into the spirit of the subject they attempt to depict.

It would be useless to expect a lady to personate Lady Macbeth who had never read the play, and who, therefore, knew nothing of the motives which prompted that ambitious woman in her guilty career. In order to give effect to the scene the subject must be familiar and thoroughly understood by the actors. There is seldom any difficulty in the selection of subjects. Historical remembrances are always acceptable, and can be made to speak very plainly for themselves, while fictitious and poetical scenes may be rendered simply charming.

Speaking from experience, one of the prettiest tableaux vivants we ever saw was one taken from Shakespeare's "Winter's Tale." As soon as the curtain was drawn aside, Hermione was seen on a raised pedestal, so lifeless and calm she might well have been mistaken for marble. Before her was standing Leontes, an old man, with his daughter, Perdita, hanging on his arm, both evidently struck dumb with amazement at the likeness of the statue to her whom for so many years they had believed to be dead; while Camillo, Florizel, and Polixenes also stood gazing in wonder. The good Paulina, dressed as a Sicilian matron, stood behind the statue, or rather on one side, as the exhibitor of it. Presently were heard strains of gentle music, when the statue stepped gracefully from her elevation, gave her hand to Leontes, and was embraced by him. The curtain here was drawn forward again, hiding from our sight a picture that ever since has been printed indelibly upon our memory.

Comic Tableaux.

For comic tableaux, scenes from fairyland or from nursery rhymes would answer the purpose admirably. Some young lady with long hair might be made to be seen kneeling as Fatima, before her cruel, hard-hearted husband, Blue Beard; he with her hair in one hand, and a drawn sword in the other, just about to cut off her head; the tearful sister meantime straining her eyes out of the window, to catch sight of her brothers, who she knows are coming with all speed to the rescue.

As to dressing and scenery, they are matters that must be left to the taste and fancy of the managers of the concern, who will soon discover that the success of tableaux, even more than charades, depends very greatly upon dress and surroundings. Charades speak for themselves, but tableaux are so soon over, that, unless the actors assume somewhat of the dress of the characters they attempt to personate, the audience would not readily guess the subject chosen. There is little doubt that both with charade performers, and with those who take part in tableaux vivants, the assumed dress gives an air of importance to the proceedings which would not otherwise exist, and acts like a kind of inspiration (upon young people especially), making them perhaps more thoroughly lose their own personality in trying to be for a time some one else.

GAMES OF SKILL

Ten-Pins.

This is a game played on smooth platforms, generally sixty feet long by four wide, called "alleys," at the end of which the pins, ten in number, are set up in triangular shape, with the apex of the triangle toward the player. The foremost pin is

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* * *
* *
*

called the *king-pin*. At the end of the alley there is a padded cushion to stop the balls sent down the alley. Each player in the match game has ten rolls, with three balls, if requisite, to each roll, making thirty balls in all, and the game is kept on a blackboard, with ten divisions for each player, each division representing the aggregate number of pins knocked down with the balls of that division. If a player knocks down all the pins with one ball it is called a *ten-strike*, and entitles him to a *double space*, or two spare balls, and he may score what he makes with the two first balls of the next division, in addition to the ten already obtained. For instance, if he makes nine with the next two balls, he scores nineteen in his first division, and then counts in the second division what he may make with the three balls. If a player knocks down the ten pins with the two balls, it is called a *spare*, and he counts, in addition to those ten, the pins knocked down by the first ball of the following division.

To give an example: We will suppose a player commencing on his first division of three balls. He rolls the first ball and makes a strike. The marker places a # over his first division, showing that the player has made ten already toward his count on that division, which, as far as balls are concerned is ended. The player then commences to roll for the second division, the *first* ball of which knocks down five pins; the *second* three pins. The result of these two balls is then added to his ten-stroke, making eighteen to be scored to his first division. With his third ball he makes one pin. This is added to the two previous balls, making nine to score to his second division, which would then be marked twenty-seven—each division including the score of all divisions before it.

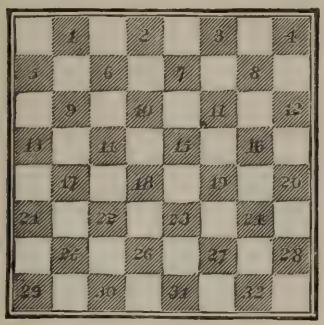
Checkers.

Checkers is a game that is very often underrated, because it is supposed that there is little or no play in it.

As a rule, a good checker-player is a more acute person on every-day subjects than is a

good chess-player, and thus we strongly recommend checkers as a game likely to call into action very useful qualities.

Black



White

Checkers is played on the same board as is chess, the men, however, being placed entirely on squares of one color.

There are twelve men on each side, arranged on the squares from 1 to 12 and from 21 to 32.

The two squares marked 1 and 5, and 32 and 28, are called the *double corners*, and these must always be on the right hand of the player, whilst the left-hand lowest square, 4 and 29, must always be on the left-hand side.

Having arranged the men, the first move is determined between the players by lot.

The men move one square at a time; thus, the man on 22 can move either to 18 or 17; the man on 23 can move either to 19 18. The men can only move forward not backward, until they have succeeded in reaching the bottom row of the adversary's squares, when they are *crowned* by having a second man placed above them. They are then termed *kings*, and can move either forward or backward as desirable.

A man may *take* an opponent's man by leaping over him and taking up the vacant square beyond him, the piece taken being removed from the board.

A man may take two or three men at one move, provided he can leap over each in succession. To understand this, place a white man at 18, 11 and 25, and a black man at 29, all other pieces being removed from the board. The black man can move and take the three white men, as he can leap to 22, 15 and 8, thus taking the men on squares 18, 11 and 25. A king can move both backward and forward any number of men as long as a square is open. Thus, place a white man on 25, 26, 27, 19, 10, 9 and 17. A black king at 29 could take all these men at once, for he could leap from 29 to 22, taking 25 man; to 31, taking 26; to 24, taking 27; to 15, taking 19; to 6, taking 10; to 13, taking 9; and to 22, taking 17, and taking all these in one move.

If a man take other men, and in the taking reach the bottom row, he cannot go on taking, as a king, until the adversary has moved.

The game is *won* when all the adversary s men are either taken or blockaded so that they cannot move, and it is *drawn* when two kings or less remain able to move in spite of the adversary.

Laws.—The following are the established laws of the game, which should be learned by every person who is desirous of becoming a checker-player:

1. Each player takes the first move a.ternately, whether the last game be won or drawn.

2. Any action which prevents the adversary from having a full view of the men is not allowed.

3. The player who touches a man must play him.

4. In case of *standing the huff*, which means omitting to take a man when an opportunity for so doing has occurred, the other party may either take the man, or insist upon his man, which has been so omitted by his adversary, being taken.

5. If either party, when it is his turn to move, hesitates above three minutes, the other may call upon him to play; and if, after that, he delays above five minutes longer, then he loses the game.

6. In the losing game, the player can insist upon his adversary taking all the men in case opportunities should present themselves for their being so taken.

7. To prevent unnecessary delay, if one color has no pieces but two kings on the

board, and the other no piece but one king. the latter can call upon the former to win the game in twenty moves; if he does not finish it within that number of moves, the game to be relinquished as drawn.

8. If there are three kings to two on the board, the subsequent moves, are not to exceed forty.

ADVICE.—The men should be kept as much as possible in a wedge form toward the center of the board. Avoid moving a man on the side square, for when there he is deprived of half his power, being able to take in one direction only.

Consider well *before* you touch a man, for a man once touched must be moved.

Avoid the cowardly practice of moving a man, and then, when you discover by your adversary's move that you have committed an error, taking your move back. Stand the consequences though the game be lost, and next time you will be more careful.

Never allow the loss of a game to cause you to lose your temper, for such a proceeding shows you to be more self-sufficient than intellectual.

As a rule, seek to play with a better player than yourself, rather than with a worse.

When you lose a game, avoid all disparaging remarks. Your adversary who defeats you will think more highly of you if you say nothing, or merely acknowledge his greater skill.

Dominoes.

This game is played by two or more persons with twenty-eight pieces, if the highest double is 6, and correspondingly more if the highest double is 12, divided by a line in the middle, into two compartments, in each of which is either a blank or spots from one to double six or double twelve. The names of these pieces, according to the numbers shown, are Double-blank, Blank-ace, Blank-deuce, Blank-trey, Blank-four, Blank-five, Blank-six; Double-ace, Ace-deuce, Ace-trey, Ace-four, Ace-five, Ace-six; Double-deuce, Deuce-trey, Deuce-four, Deuce-five, Deuce-six; Double-trey, Trey-four, Trey-five, Trey-six; Double-four, Four-five, Four-six; Double-five, Five-six; Double-six and so on to Double-twelve.

The pieces are shuffled on the table, faces down, and the players draw at random the number the game requires. An infinite variety of games may be played with dominoes, but those most universally known are Draw and Muggins.

DRAW GAME.—This game, is played with seven pieces, the highest double leads and is matched at one end. When a player cannot play, he is obliged to draw from the pool until he can, or until he has exhausted the stock of pieces, even though the game be blocked by his adversary. The player may draw as many pieces as he pleases. He *must* draw until he can match. After a lead has been made there is no abridgement to this right. The object of drawing is to enable him to play. Having drawn the required piece, the rule to play remains imperative as before. The draw game is, however, based upon the unabridged right to draw, and is known as a distinctive game by this privilege only.

MUGGINS.—In this game each player draws five pieces. The highest double leads, and after that they lead alternately. The count is made by fives. If the one who leads can put down a domino containing spots that count up to five or ten, as the double-five, six-four, five-blank, trey-deuce, etc., he counts that number to his score in the game. In matching, if a piece can be put down so as to make five, ten, fifteen, or twenty, by adding the spots contained on both ends of the row, it counts to the score of the one setting it. Thus a trey being at one end and a five being at the other, the next player in order by putting down a deuce-five would score five; or if double-trey was at one end, and a player was successful in playing so as to get double-deuce at the other end, it would score ten for him. A double-six being at one end and four at the other, if the next player set down a double-four, he counts twenty—double-six (*i. e.* 12) + double-four (*i. e.* 8) = 20. The player who makes a count must instantly announce it when he plays his piece, and if he fails to do so, or if he announces the count wrongly, and any of his opponents calls "Muggins," he is debarred from scoring the count. If a player cannot match, he draws from the pool, the same as in the draw game, until he gets the piece required to match either end, or exhausts the pool.

As in the draw game above, the first one who plays his last piece adds to his count the spots his opponents have; and the same if he gains them when the game is blocked, by having the lowest count. But the sum thus added to the score is some multiple of five nearest the actual amount. The number of the game is two hundred, if two play; but one hundred and fifty, if there be three or more players.

Backgammon.

This is a game played by two persons upon a board, or *table*, which is divided into two parts, upon which there are twelve points of one color and twelve of another, usually light and dark in succession. Each player has fifteen men or pieces of different colors, also two dice and a dice-box. The men are placed by each player on the board in the following manner: Counting the points on each side from 1 to 12, each player puts two of his men on his adversary's No. 1, and five on No. 12, five on his own No. 6, and three on No. 8.

The object of each player is to get all his men played round into the inner table (Number 7 to 12), moving them from point to point, according to the throws of the dice, which are taken alternately. They are finally moved off the board in response to fortunate throws, the player who gets all his men off first winning the game. Backgammon is a very pleasant game of chance for family purposes, where two persons wish to enjoy a leisure hour.

Chess.

One of the oldest, and in many respects the noblest, of games, is that known as chess. It is entirely a game of skill, and admits of a very wide gradation in expertness, the difference in skill between the beginner in chess and the champion player being almost illimitable. To play it well needs a high exercise of the mental power of calculation and prevision of the results of moves, and it is apt to exert a strain upon the mind which makes it rather an intense mental exercise than a diversion.

Chess is played upon a square board, marked with 64 small squares, alternately black and white. Each player has sixteen pieces, eight of which are placed on his first row of squares, and eight (named pawns) on his second row. Those on the first row consist of two rooks, occupying the corner squares; two knights, on the adjoining squares; two bishops, on the third squares from the corners; a queen, on the fourth square from the left, and a king on the fifth square. Each piece has its particular direction of moving; the rooks going in straight lines horizontally or vertically, the bishops diagonally, the queen in any straight line. Each of these moves any distance that is unobstructed. If its line of motion is anywhere occupied by an opposing piece, it takes this and occupies its square.

The knight can move only two squares at a time, in a semi-diagonal direction, or to the third square between a diagonal and a direct line. The pawns move straight forward only; at first two squares, afterwards one square only. They cannot take a piece directly in front, but can, if the piece lies in a diagonal square. If a pawn is carried across the board to the opponent's first line it can be made a queen, and is given the queen's moves. Finally, the king can move only one square at a time, in any direction, but cannot move into an open square which is covered by one of the opponent's pieces. If it becomes so surrounded as to be *checked* on all sides; that is, if it occupies a position into which a hostile piece could move, and all the open spaces around it are threatened by other hostile pieces; and if the latter pieces are so protected that none of them can be taken by any of the player's men, the king is said to be *checkmated*, and the game is lost to its owner. To *mate* the king is the object of the game.

Draughts.

Not unlike chess in general principle, but far simpler, is the old game of draughts or checkers. It is played on the same kind of a board, but the players have no such variety of moves. The men consist of 24 round flat pieces, of different colors, usually black and white. In play these are placed on the white squares, each player occupying the four white squares in each of the three rows on his side of the board. This leaves

the two rows in the middle open for movements of the pieces.

The pieces can move diagonally only, one square forward at a time, but if a hostile piece occupies the adjoining square, with an open space beyond, a leap may be made into this space and the hostile piece taken from the board. If two or three hostile pieces lie thus in succession they may all be leaped and taken from the board. When a piece reaches the opponent's first row it becomes a king, and can move either backward or forward. The game is won when a player has taken all his adversary's pieces, or blocked them so that they cannot move. If neither party can force a win the game is *drawn*.

Billiards.

Chess and draughts are both games in which the players begin with equal powers, and the result depends wholly on skill. The same is the case with billiards, a game played with ivory balls on a smooth-cushioned table, with raised sides to retain the balls, and cause them to roll off at an angle of reflection. The balls are struck and driven by a long wooden *cue*, with a bit of leather on its tip. Some tables have pockets in the corners and on each side, a ball driven into one of these scoring a point. In these games four balls are used. Pockets are no longer used on American tables—except in playing pool, a special form of the game—and only three balls are used. This reduces the game to one of pure skill. A *carom* consists in hitting both object balls with the cue ball, each carom counting one point. A cushion carom is made by striking one or more cushions, or sides of the table, before making a carom; or by striking a ball, then a cushion and then the other ball. This game requires great skill, but very large runs, without a miss, have been made by brilliant experts.

SOCIAL ORGANIZATIONS

In recent times the growth of clubs, both for men and women, in American communities has been very great. These are organized for numerous purposes. Some of them possess buildings arranged for the convenience of their members, their purpose being to promote social intercourse. Many other clubs and societies meet only at stated periods, their object being intellectual, reformatory, scientific, etc. Lectures are given, refreshments are provided, and social divertisement is often made a feature of the occasion.

In addition to the more formal associations, there are many devoted to neighborhood intercourse, instruction, or amusement, such as current-event classes, whist clubs, church organizations of various kinds, and other forms of association designed to bring a company together at stated periods and promote some interest in which all are concerned. Such associations, except those of a minor character, need some form of organization, and must be governed by certain fixed laws and regulations. Some consideration of the organization of such societies may be of utility.

Election of Officers.

The first thing to be done, before any business question can come up properly for discussion, is to appoint officers, two in particular, a president or chairman, or presiding officer under any name, and a secretary, whose duty it is to keep a record of the proceedings at the several business meetings. There may need to be two secretaries: a recording secretary, to keep the minutes of the meetings, and a corresponding secretary, in case the association is likely to require more correspondence than the recording secretary cares to undertake. There are often also one or more vice-presidents chosen. If the society is other than a simple meeting from house to house of its members, dues to pay expenses are likely to be necessary, and a treasurer must be appointed to take charge of the funds, notify the members when their dues are payable, pay all bills, and meet any expenses.

This is not all. Unless the association is of a very informal character and its business proceedings few and simple, some written laws and regulations become necessary,

governing the methods of conducting business, of electing officers, passing resolutions, admitting members, etc. Usually these take the form of a constitution, in which are recited the name and purpose of the association, its fixed modes of operation and permanent principles, and a set of by-laws, relating to methods of proceeding at meetings, mode of choice and length of term of officers, their respective duties, the election of members, dues, fines, resignations, and all subjects which it may become desirable to change at any time as new circumstances arise.

Duties of Officers.

Of the duties of officers, those of the chairman are most important. He is expected to preside at meetings, see that they are conducted in agreement with the by-laws, call for reports of committees, hear all motions made by members and amendments to motions, allow a reasonable time for discussion, and put the motion to the decision of the members, who vote by "aye" and "nay," or, in case of doubt as to the result, by rising, by voting when their names are called, or in any manner adopted to get the true result of the vote.

The chairman also considers objections and points of order, and decides upon them, his decision being final, unless an appeal is made to the members. This appeal is debated before a temporary chairman, chosen to hear it, and may be decided for or against the decision of the president. These general duties of the presiding officer must be somewhat flexible in operation, to meet the numerous exigencies which may arise in the proceedings of any society. He needs to be firm and just, and to have sufficient power of control to preserve order, to decide between wrangling members, and to insist on the meetings being conducted in strict subservience to the requirements of the by-laws. The duties of the secretary and treasurer need not be described. They are simple and formal, the former being confined to keeping a true record of the proceedings, the latter to the collection of dues and other funds and paying them out on properly accredited bills. Committees are frequently appointed to consider questions which cannot conveniently be decided at the regular meetings of the association. Their powers are limited to a decision in committee and a report, favorable or unfavorable, to the general meeting, which will act upon the report. Occasionally, indeed, a committee is given "power to act" on some question, in which case this is not reported back to the society, but is settled by the committee.

The hearing and deciding upon motions, reference of subjects to committees, etc., lead to many intricacies in large and important public bodies. Instead of attempting to explain these at length, we give them in tabulated form, as follows:

PARLIAMENTARY LAW AT A GLANCE

List of motions arranged according to their purpose and effect.

[*Letters refer to rules below.*]

Modifying or amending.
8. To amend or to substitute, or to divide the question . . . . . K
To refer to committee.
7. To commit (or recommit) . . . . . D
Deferring action.
6. To postpone to a fixed time C
4. To lay on the table . . . . . A E G
Suppressing or extending debate.
5. For the previous question . . . . . A E M
To limit, or close, debate . . . . . A M
To extend limits of debate . . . . . A
Suppressing the question.
Objection to consideration of question . . . . . A H M N
9. To postpone indefinitely . . . . . D E
4. To lay upon the table . . . . . A E G
To bring up a question the second time.
To reconsider a debatable question . . . . . D E F I
To reconsider an undebatable question . . . . . A E F I
Concerning Orders, Rules, etc.
3. For the orders of the day . . . A E H N
To make subject a special order . . . . . M
To amend the rules . . . . . M
To suspend the rules . . . . . A E F M
To take up a question out of its proper order . . . . . A E
To take from the table . . . . . A E G
Questions touching priority of business . . A
Questions of privilege.
Asking leave to continue speaking after indecorum . . . . . A
Appeal from chair's decision touching indecorum . . . . . A E H L

Appeal from chair's decision generally	E	H	L
Question upon reading of papers . . .	A	E	
Withdrawal of a motion	A	E	
Closing a meeting.			
1. To fix the time to which to adjourn	B		
2. To adjourn (in committees, to rise), or to take a recess, without limitation .	A	E	F

Order of Precedence.—*The motions above numbered 1 to 9 take precedence over all others in the order given, and any one of them, except to amend or substitute, is in order while a motion of a lower rank is pending.*

RULE A. Undebatable, but remarks may be tacitly allowed.

RULE B. Undebatable if another question is before the assembly.

RULE C. Limited debate allowed on propriety of postponement only.

RULE D. Opens the main question to debate. Motions not so marked do not allow of reference to main question.

RULE E. Cannot be amended. Motion to adjourn can be amended when there is no other business before the house.

RULE F. Cannot be reconsidered.

RULE G. An affirmative vote cannot be reconsidered.

RULE H. In order when another has the floor.

RULE I. A motion to reconsider may be moved and entered when another has the floor, but the business then before the house may not be set aside. This motion can only be entertained when made by one who voted originally with the prevailing side. When called up it takes precedence of all others which may come up, excepting only motions relating to adjournment.

RULE K. A motion to amend an amendment cannot be amended.

RULE L. When an appeal from the chair's decision results in a tie vote, the chair is sustained.

RULE M. Requires a two-thirds vote unless special rules have been enacted.

RULE N. Does not require to be seconded.

GENERAL RULES.

No motion is open for discussion until it has been stated by the chair.

The maker of a motion cannot modify it or withdraw it after it has been stated by the chair, except by general consent.

Only one reconsideration of a question is permitted.

A motion to adjourn, to lay on the table, or to take from the table, cannot be renewed unless some other motion has been made in the interval.

On motion to strike out the words, "Shall the words stand part of the motion?" unless a majority sustains the words, they are stricken out.

On motion for previous question, the form to be observed is, "Shall the main question be now put?" This, if carried, ends debate.

On an appeal from the chair's decision, "Shall the decision be sustained as the ruling of the house?" The chair is generally sustained.

On motion for orders of the day, "Will the house now proceed to the orders of the day?" This, if carried, supersedes intervening motions.

When an objection is raised to considering questions, "Shall the question be considered?" objections may be made by any member before debate has commenced, but not subsequently.

Hints for Literary Clubs.

In many communities there are literary clubs which, if properly conducted, may be the means of many delightful social reunions during the long winter evenings. Everywhere there are thousands of clubs composed of young people, who meet, usually once or twice a month, in the lecture room of the church, in the town hall, in the village schoolhouse, or at the homes of the members. The vital elements in the life of such a club must, of necessity, be simplicity of organization, an absence of red tape, and good fellowship. If too much importance be given to parliamentary rules, interest in the society may be lost. Soon after organization it may be proper to devote one or two evenings to talks on parliamentary rules and practices, and much amusement and interest may be aroused in having a Parliamentary evening.

The Duty of the Members.

To obtain the greatest good from the club, all programmes for the season should, in a general way, be mapped out at the start, so that the individual members may become so interested in the continuity that they will be regular attendants.

A law of the club should be that every member shall contribute something each evening (if the club be not too large to make this possible), however trifling the part may be. There is always latent talent in even the most backward members which will reveal itself under careful watching.

The literary selections should be serious, pathetic, dramatic, and humorous, diversified by vocal and instrumental music, with dialogues, recitations or appropriate quotations, and occasionally a piece of blackboard work, and any other interesting features that the intellectual material of the club may make possible.

It should be the aim to make the successive evenings as different as possible in character.

TWO EXCITING GAMES FOR BOYS

THE TUG OF WAR is a game which gives a test of strength and a fine play for muscle.

LEAP-FROG delights every boy as a game easily played when time is short and other resources for entertainment are wanting. It also gives good exercise to the muscles.

How to Organize a Literary Society.

The work of organizing a literary society need not be complicated. Notice is given privately or by public announcement to those likely to be interested, and they meet at the designated place and hour. The person who has called the meeting says, "I move that Mr. (or Miss) Smith be chairman," and when this is seconded, he puts the question by saying, "Those in favor of Mr. Smith will say aye." When all these have voted, he says, "Those opposed will say no." Usually there will be no opposition, and he declares Mr. Smith (or Miss Smith as the case may be) elected, who then assumes the chair and puts all future questions. A secretary is elected in the same manner, and the meeting is ready for business.

The chairman then calls on some one to state the object of the meeting. This may be done in very few words, as follows: "There has been a sentiment in favor of organizing a society for literary and social purposes, and we have therefore made this call. To determine your sentiments, I move that we now proceed to organize such a society." The motion is seconded, put in the usual form, and declared carried. Then it is usual to appoint a committee to form a Constitution and By-laws, and present at a subsequent meeting, if not already prepared by interested parties, which, when presented, are discussed article by article, amended so far as the meeting may desire, and adopted. Those wishing to become members sign the Constitution, pay their dues if any are required, and the meeting then becomes the society. The officers provided by the Constitution may be elected at once, or at a meeting appointed for that purpose; only those persons who have signed the Constitution vote and, when the election is completed, the society is duly launched and ready for business. As much should be done as possible at this meeting in the way of preparing a programme for the first regular meeting and securing participants in the exercises, that the first ardor of the society may not be chilled by delay. The following is a simple form for a Constitution, which may be changed or added to at the pleasure of the members of the proposed society.

Constitution.

ARTICLE I.

Name.

This society shall be known as ——— Society of ———

ARTICLE II.

Object.

The object of this society shall be the general improvement of its members, especially in literary and social matters.

ARTICLE III.

Membership.

Any person of good character may become a member by signing the Constitution and paying the initiation fee.

ARTICLE IV.

Officers.

The officers of this society shall be President, Vice-President, Secretary, Treasurer, and a Literary Committee of three members. They shall be elected by ballot and serve for six months. The President shall preside at all meetings and introduce the speakers appointed on the programme for each meeting. The Vice-President shall perform these duties in the absence of the President. The Secretary and Treasurer shall perform the duties belonging to such officers. The Literary Committee shall arrange the programme for each meeting and assign speakers as early as the preceding meeting In case any speaker is absent, they shall assign other members of the society to take his or her place.

ARTICLE V.

Amendments.

This Constitution and By-Laws may be amended by a majority vote, notice of such amendment having been given in writing at the preceding meeting.

By-Laws.

ARTICLE I.

Meetings.

Meetings shall be held as follows:

Regular meeting on [Friday] of [each week]. Semi-annual meetings on [the last Friday] of [December and June] for the

hearing of reports from the Secretary and Treasurer, and for electing officers.

ARTICLE II.

Fees.

Fees shall consist of an initiation of [fifty cents] and [twenty-five cents] per month.

ARTICLE III.

Expulsions.

Any member who violates the Constitution and By-Laws, refuses to perform according to the assignment of the Literary Committee, or neglects to pay his dues for [three months], may be expelled by a two-thirds vote of the members present; but a motion to expel shall always lay over to the meeting following that at which it is offered.

Public Speaking.

Public speaking is an art, to be sure, but one that almost every one can acquire with a little practice. What is needed is confidence in one's power to acquit himself creditably. There must always be behind it all a knowledge of the subject. The speaker should then speak as though he were talking to friends and endeavoring to interest them. He may feel assured that his audience is in sympathy with him and wishes to see him succeed. The beginner will do well to write out beforehand what he wishes to say, correct it carefully, and then read it over a number of times until he has well fixed in his mind what he has written. In the delivery it is not absolutely necessary that he should say it word for word as it is written. Many distinguished public speakers follow this rule, and they speak so naturally that very few people would suspect that their address had been carefully written out and prepared beforehand.

In former times the national holidays and festivals were occasions for displays of oratorical power and brilliant speaking, or, as some one said, "in the soaring of the American eagle." All this has long since passed by, and public speakers recognize that their audience must be entertained, amused and instructed, that they do not come together to be lectured or preached to.

After-Dinner Speeches. — Public dinners are not so formal as national and other celebrations, as usually there are fewer persons present, and they are more or less acquainted with one another. After the serving of the dinner or refreshments it is usual to have an hour or more of enjoyment in the way of speeches, which are called toasts. Some one is selected to preside on this occasion, and he proposes the toast and calls upon the speaker to respond. In doing this he is expected to make some happy remarks which will serve to introduce the speaker. He may do this by incidentally referring to the subject which is proposed, and also to the speaker who is to respond. Of course, it is understood that unpleasant and pointed allusions or references are to be avoided, and nothing said or done which will mar the pleasure and happiness of the occasion. In responding to a toast the speaker gains the good will of his audience by some happy reference to the words of introduction which have been spoken, always in a pleasant and happy vein, and then introducing the topic upon which he is to speak by some anecdote or story or allusion which will at once hold the attention of his hearers. Almost every subject that will be treated on such an occasion as this will give room for a few serious thoughts which will have some uplift to them and also many happy and pleasant remarks which will bring smiles to the faces of the hearers. These responses to toasts should not be longer than five or ten minutes. We suggest some topics for toasts for different occasions:

FOR THE FOURTH OF JULY.

The day we celebrate: "May the Constitution always follow the flag."
The American Eagle: "The older he grows the louder he screams and the farther he flies."
The Ladies: "First in the hearts of their countrymen."

FOR CHRISTMAS DINNER.

"Christmas day comes but once a year. May it bring joy to all hearts."
"'God bless us all, each and every one,' said tiny Tim."
"St. Nicholas, the friend of all, the only saint in the calendar who is *for-giving*."

WEDDINGS.

The Happy Pair: "Two are company, three are not."
The Fair Bride.

HEALTHFUL OUTDOOR GAMES TO DEVELOP THE BODY

Jingling.

A ring is staked and roped out upon a piece of turf, and inside this the players take their places. One of them has his hands tied behind him, and carries a bell slung round his neck; all the rest are closely blindfolded. The "jingler," or bell-man, tries to escape from the blind men: while they, guided by his bell, do their best to catch him. If the number of players be duly apportioned to the size of the ring, there is positively no end to the fun that may be got out of the game; a good jingler will lead the blind, men into all sorts of scrapes—of course without compromising himself—into each other's arms, over the ropes, or over some luckless companion who has come to grief in laboring after the jingler, or a hundred other devices equally effective and amusing.

Perhaps the most absurb scenes occur when two or more blind men rush into each other's arms and grapple frantically, each persuaded that the other is the jingler, and ready to drag or be dragged anywhere rather than relax their grasp.

In a match the winner is either the jingler himself, if he can contrive to keep clear of his pursuers for the requisite time, or, if he is caught, the blind man who catches him.

Tierce.

If smartly played, this is a very good game for cold weather. To play it properly there should be at least eighteen or twenty players, who arrange themselves as in the annexed diagram, all in pairs, except one set of three, and the game is as follows: The outside player, marked *, runs round the circle, and tries to catch three or a "tierce" together in a line. If he can do this, and touch the outsider, he takes his place in the circle, and the player just touched becomes outsider.

The outermost man of the tierce, therefore, when he sees the outsider coming his way, slips from his place into the middle of the ring, and stations himself in front of some other pair at a distant point in it, thus making a fresh tierce, to which the outsider has to hasten, only, perhaps, to be disappointed in like manner.

Where there are many players, and the ring is consequently large, there should be two or more tierces, and thus the game will be made more lively by making it more difficult to avoid being caught. The game must be kept up with spirit or it soon falls tame; but with lively players it is excellent fun.

Tag.

This is the simplest of all games. Out of a number of players one goes "Tag," and tries to catch and touch any of the others indifferently: the player so touched becomes Tag in his turn until he touches some one else. The player touched cannot touch back until he has first chased another player.

This is a capital impromptu game for cold weather; the running soon warms up even the most chilly. It must, however, to be played with success, be confined within tolerably narrow boundaries.

Cross-Tag.—Tag calls out the name of the player he intends to chase, and sets off after him; the other players then run across between Tag and the fugitive. Each time a player crosses between the two, Tag must leave the original chase and follow the player who has crossed, and so on, perhaps chasing in turn every individual player before he can effect a capture.

Touchwood-Tag.—A series of posts or trees is selected; as long as the player is touching one of these authorized posts, Tag cannot touch him; his only chance is to catch him while flitting from one post to another. Two players are not allowed to touch the same post; if Tag can catch two so situated, he may touch the last comer, who thus becomes Tag.

The life of this game depends upon the pluck and spirit of the runners, for Tag can do nothing until they expose themselves by running. A constant interchange of posts should be kept up, or the game flags and loses its interest. It may be played either like "Puss in the Corner," with only one station for each runner, so that running can only be effected by exchanging posts, which is perhaps the preferable game; or with a number of posts in excess of the number engaged.

"Sling the Monkey."

This is a capital game, and can be played anywhere where there are trees. One player who is chosen by lot, takes the part of Monkey, and is fastened to a tolerably high branch of a tree by a strong cord knotted in a "bowline" loop and passed round his waist. The other players now baste the monkey with knotted handkerchiefs, and he armed in like manner, endeavors to retaliate. If he succeeds in striking one of them, he is at once released, and the other takes his

place as monkey. He must make haste in doing it, or he may be basted until he is fairly in the loop. With players who don't mind a little buffeting this game becomes exceedingly lively: an active monkey is very difficult to approach with safety, and, of course, gives much more life to the game.

The cord should be just long enough to enable the monkey to reach the ground comfortably under the branch. Half the fun of the game lies in actual *slinging* of the monkey, one of whose most effective *ruses* is to throw himself forward on the rope, pretend to start off in one direction, and then come back with a swing in the other.

The branch to which the cord is attached should be of some considerable height from the ground, or there will not be play enough in the rope; and it need scarcely be impressed upon the reader that both rope and branch must be strong enough to bear the strain put upon them by the weight and movements of the monkey.

"Knights."

Two sturdy boys, each with a smaller boy on his back, engage in a mock tournament, themselves acting as horses, while the youngsters grapple and strive to unseat each other.

The real brunt of the fighting falls on the horses, upon whose strength and dexterity, much more than upon that of their respective "knights," depends the ultimate issue of the combat. The horses may shove and jostle one another, but must not kick, trip, or use their hands or elbows.

SLING THE MONKEY.'

The victor is he who gains most falls in three rounds. The game should only be played upon turf, for safety's sake; for sometimes, when horse and man go down together, the fall might prove a nasty one on hard ground, and at any time the rider is liable to be brought off backward with a jerk, under which circumstances he will be thankful to measure his length on the soft turf instead of lumpy gravel or unyielding pavement.

"Cock-Fighting."

Two players are made to sit on the ground draw their legs up, and clasp their hands

Two falls out of three decide the game; if both fall it is no "round," and does not count.

As the player may not unclasp his hands even when down, he is quite helpless, and must be assisted by his friends.

Tug-of-War.

A number of players divide into two parties, each under the command of a leader. A line is marked out on the ground, and the two parties, laying hold of either end of a stout rope, try to drag each the other across the line.

together over their shins. A stout stick is then passed through under their knees, and over their arms at the bend of the elbows, as in the cut, and there they sit trussed like a couple of fowls.

Thus prepared, the two combatants are placed face to face, their toes touching, and are left to fight it out. This they do by striving to knock each other down, each to overbalance the other without loosing his own equilibrium.

Simple as the game may appear, the party which is physically most powerful does not necessarily have it all his own way; a smart captain will often make up by superior *finesse* for any deficiency of his side in strength and weight.

The two captains stand facing each other at the line, and measure wits as well as strength.

One very common but very excellent *ruse*, especially with a side somewhat over-

weighted by its opponents, is to put a heavy drag on the rope, not attempting to pull up the opponents—in extreme cases even allowing them to gain ground inch by inch—then suddenly, when, flushed with success, they are unprepared, to let the rope go by the run: if this be done neatly, down they must all go on their backs in a struggling, helpless mass. The instant they are down the successful party must clap on and run away with them, which they will now easily do, clean over the line.

The success of this maneuver depends chiefly upon the captain's seizing the right moment for its execution; but the whole of his side must obey instantly when the signal is given, or the attempt will prove futile; one hand on the rope after the others have let go is sufficient to ruin the whole affair; nothing but instantaneous and simultaneous action has a chance of success.

This game is now a regular part of the program in athletic sports.

Leap-Frog or Spanish Fly.

A player is chosen by lot for leader, and another for "first back." The leader "overs" in all sorts of eccentric fashions, and the rest are bound to imitate him, even to the minutest particular, under penalty, in case of failure, of relieving the "first back" until relieved in turn by some one else.

A leader with a ready invention may hit upon innumerable variations in the method of "overing;" such as, for instance, putting a cap on the back, and "overing" without knocking it off, or even making a pile of two or three, and "overing" without touching; taking the one cap off and leaving his own behind—a very neat trick; throwing his cap up before "overing," and catching it after, before it touches the ground; and so on almost *ad infinitum*.

"Duck on a Rock."

A very lively game for any number of players from four or five to a dozen. Each player procures a smooth, somewhat flattened pebble; and a large stone about ten inches or so in diameter, with a flat top, is set up to serve as "mammy." A "home" is marked out about ten yards or so from the "mammy," and from this the players "pitch for Duck," that is to say, they try to pitch their pebbles as near to the "mammy" as possible; the one who makes the worst shot goes "Duck." He puts his pebble upon the "mammy," and the rest of the party in succession stand at the home, and endeavor to knock the "duck-stone" off the "mammy."

So far there is not much life in the game; but the player having pitched his pebble, has to get it back again for his next shot: the instant he touches his stone he lays himself open to be touched by the Duck, in which

case he has to take Duck's place; Duck, however, has this power of touching the other players only as long as the "mammy" is crowned—that is, as long as his pebble rests on it—so that the displacement of this is the signal for a general scurry homeward, and Duck must be very quick in replacing the stone, to get even a chance of touching one of the players.

"Fly the Garter."

A line, or, as it is technically termed, a "garter," is marked out on the ground: the "first back," chosen by lot as before, stands a foot from the "garter," and sets a "back;" the rest "over" him in succession, springing from *inside* the "garter." He then advances one foot more, and they "over" him again as before; then another foot, and if now all succeed in "overing" him, he takes a close-footed leap forward as far as he can, and sets a fresh "back" where he alights. If they still succeed in "overing" him, the game begins again, and he starts from the "garter" afresh. If, however, at any time one fails to "over" him, they change places, and the game begins anew.

Nine Holes.

Strictly, this game should be played by nine players, and nine only, but the actual number is not material to the spirit of the game, and the number of holes may be

modified at will, to suit the number of players. To play it, nine holes, about six inches wide and three deep, are dug near a wall, and a line is drawn opposite these at a distance of five or six yards. Each of the players takes one hole, and one of them, standing at the line, pitches a ball (a tennis or soft rubber ball is best) into one of these holes. The player to whom the hole belongs snatches the ball out and throws it at one of the others, who have meanwhile scattered in all directions. If he hits him, the player just struck becomes "pitcher;" if he misses him he loses one, and himself becomes "pitcher." When a player has thus missed three times, or technically has "lost three lives," he is considered "dead," and stands out until the conclusion of the game. The winner is he who holds out to the last. Caps are sometimes used instead of holes, and serve the purpose equally well, though perhaps they would be better on the heads of their respective owners.

Hop-Scotch.

This is very good practice for balancing the body and acquiring steadiness on the legs. Chalk or otherwise mark out on the ground a figure like the accompanying diagram, on a scale of about four feet to the inch.

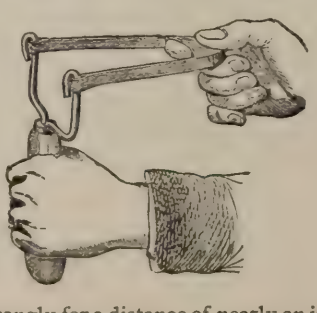
Not more than two or three should play at one figure, or there will be too long a time between the turns. The players "pink" for first turn; that is, they pitch the stone or piece of tile with which they are going to play at the cat's face at the rounded extremity, sometimes also called and drawn as "the pudding." He who gets nearest leads off.

Standing at the square end, he throws his tile into compartment 1, hops in and kicks the tile out—still hopping—to the starting-point. He next throws the tile into No. 2, hops into 1, thence to 2, and kicks the tile out as before. He next goes on to 3, and so on until he reaches 8, which is called the "resting-bed;" having reached this he may rest himself by putting his feet into 6 and 7, resuming his hopping position, however, before he goes on with the game, in which he proceeds as before. Until he reaches the "cat's face" or "pudding," he may have as many kicks as he likes in kicking the tile out, but when he reaches that he must kick it through all the other divisions at one single kick, the successful achievement of which crowns the game.

If the tile is pitched into a wrong number, or rests on one of the lines, either in pitching or kicking, or it is kicked over the side lines, the player loses his innings; if he puts down both feet while in the figure, except at the resting-bed, or sets his foot, in hopping, on either of the lines, he suffers the same penalty. Some players who are particular, and cultivate the refinements of the game, are in the habit of using a circular disk of lead, instead of the usual irregular, and therefore uncertain piece of tile.

The Bean Shooter or Catapult.

Catapults may be made by any boy with very little trouble. Get a forked stick, the shape of the letter Y, about six or seven inches in length, the prongs about two inches apart. To the extremity of each of these prongs lash securely a strip of strong India-rubber sping about six inches in length, and attach the loose ends of these springs to an oval piece of soft leather, 1½ inches long by an inch in width, whipping them carefully



and strongly for a distance of nearly an inch; this oval forms a kind of pocket in which to place the missile.

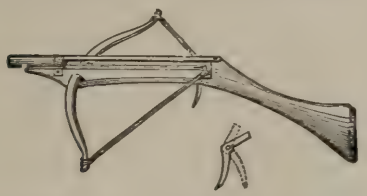
The most useful ammunition is duck-shot; clay marbles do very well, and even gravel-stones at a pinch may be made to do good service; but the first named are preferable

in every way, for range, accuracy, penetration and portability; they can be fired in volleys, too, when occasion requires, which the others cannot, on account of their size.

With a tolerably powerful catapult, such a one, for instance, as described above, large birds may be brought down by a well-directed volley of heavy shot.

Cross-Bow.

A cross-bow is in effect nothing more nor less than an ordinary bow set crosswise in a butt in shape like an ordinary gunstock.



A great deal of amusement may be got out of a cross-bow by shooting at a butt or target. In default of more properly constructed missiles, pipe-stems form excellent bolts, and will give a very good account at a dozen paces or so.

Hare and Hounds.

This is a good running game, and in high repute among our boys. In playing it one boy (or in a long course two) represents the Hare, and the rest the Hounds. The hares carry with them bags full of paper torn up very small, which they scatter behind them as they run, to represent scent, and by this the hounds trace them up and endeavor to capture them. The hares, of course, endeavor to mislead them by all sorts of doublings and twistings, or by going over difficult country.

The hares are debarred, by the rules of the game, from employing all such artifices as making one or more false starts at any part of the run, and from returning on or crossing their previous track. Should they break either of these rules, or should the "scent" give out, they are considered as caught, and lose the game accordingly. They must, of course, always scatter a sufficient amount of scent to be plainly visible to the hounds. If there be two hares, they must not separate under any circumstances: for all the purposes of the game they are to be considered as strictly only one individual.

The hounds will find a little organization and discipline a wonderful assistance to them in baffling the tricks of the hare. A captain and a whipper-in should be chosen, the former to lead and direct, and the latter to bring up in the rear. As long as the scent is strong, the whole band will go somewhat in Indian file, merely following their captain; but when he is at fault he must sound the horn, which he carries *ex officio*, and call a halt. The whipper-in thereupon takes up his post at the point where the scent is broken and the others sweep round in a great circle, covering every inch of ground, to discover the lost trail. Sometimes the captain and whipper-in carry white and red flags respectively, and use them to mark the points where the scent is broken.

The hares should not be the swiftest runners, or they would never be caught. Endurance, pluck, and a readiness of invention are the great points in a hare. The more he trusts to his head and the less to his legs, the better the chase. The hares are generally allowed not less than five or more than ten minutes' law, according to circumstances. They should take care to survey their ground before they go over it, or they may get themselves into all sorts of difficulties. A pocket compass will be found an invaluable companion both to hares and hounds. From twelve to fourteen miles is a good run; but some little training and practice are requisite before such a long course can be covered.

Handball.

Handball may be played, in a rough way almost anywhere: the only absolute requirements are a tolerably smooth and lofty wall, fronted by a reasonably smooth and level piece of ground. With these and an india-rubber or tennis ball a game may be got up at almost a moment's notice.

The wall and ground need some little preparation, which need not, however, take more than a few minutes. A line must be drawn horizontally along the wall with chalk or other suitable substance, at about

thirty inches from the ground; and three lines *on* the ground, two extending parallel from the wall, about fifteen feet apart, to a distance of some eighteen or twenty feet; and one parallel with the wall and about six feet from it. The line on the wall is called simply "the line," the two long ones on the ground "the boundaries," and the cross-line "the scratch." The ball when in play must be made to strike the wall above the line and must fall to the ground inside the boundaries.

The number of players may be two or four. As there is no material difference between the game with two and that with four players, the description of the one will do for the other; for simplicity's sake, therefore, the game with two players will be described.

The theory of the game is as follows: One player strikes the ball with his hand up against the wall above the line, making it fall beyond the scratch, and the other is then bound to meet it, and before it touches the ground a *second* time, to return it again to the wall for the first player to meet it in like manner, and so on alternately, only that after the ball is "served" it is not requisite that it should fall outside the scratch. The players toss up for first lead-off, and the winner serves or delivers the ball as above described; if he himself is first to fail in properly returning the ball to the wall, he is out, and player No. 2 becomes server; but if the second player so fails, the server counts one toward his game, and serves the ball afresh for a new bout. The game is mostly eleven or fifteen, the former number being perhaps the more common and the most interesting.

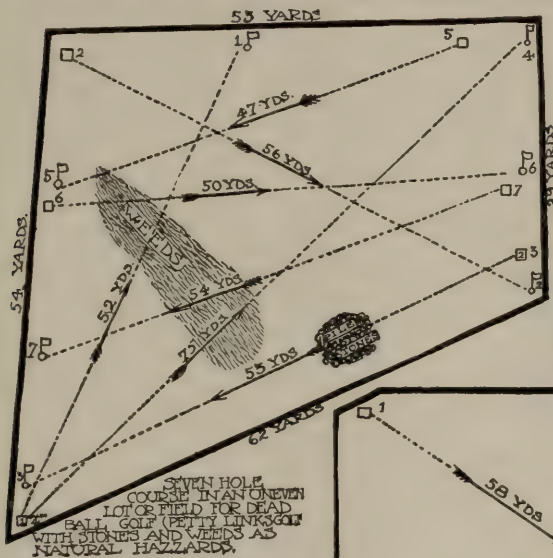
The real art, after the knack of striking the ball fairly with the hand is once mastered, lies in the serving. The server, as will be preceived, has every advantage: in the first place, if he fails, he only loses his turn, while if his opponent fails, he loses one to his score, which is no slight advantage, especially near the end of the game. In the next place, the server takes his own time in delivering the ball, and is left perfectly cool and collected to make it as difficult as possible to his opponent to play it, while the latter must take it as it comes, and very often be only too glad if he can get it duly back to the wall, without any consideration of the chance it may offer to th former; so that the server may often have a series of easy balls to play, while he is enabled to return them in such a manner that his opponent must strain every nerve to keep the ball up. This cannot but tell in his favor, and in this way a first-rate server will very often get the better of a much more active and brilliant, though less crafty player.

HANDBALL.

When four play, they play two against two, and the game proceeds exactly as above, it only being necessary that the ball should be played by one of either side alternately. Usually they divide the ground between them, one of either side standing near the wall and the other well back.

How to Play Real Golf on a Five Acre Meadow.

It is interesting for all lovers of golf to know that golf is being played on small links with a new ball in place of the hard, ivory ball, which is used on large links. This ball was born of necessity, on the New England coast, and has filled a long felt want.



Certain naval officers fond of golf found it difficult to get to the club links to which they were invited at places visited by the fleet, and so were often deprived of much needed exercise and relaxation; whereupon Captain Wright, of the North Atlantic Squadron, devised a ball of cork (or of pine) and improvised a course in a five acre meadow where successful golf was played, at ports visited by this squadron.

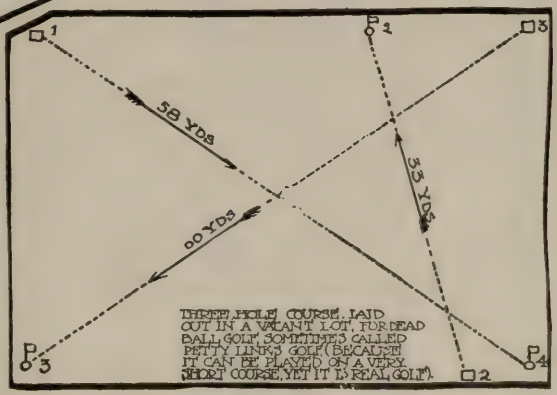
This ball might be utilized extensively by the vast army of people deprived of regular links by distance, expense or want of time. The new ball of cork or of light wood is the same size as the regulation ball, and when painted resembles it closely.

The principle involved is, of course, lightness, which deprives it of carrying power. As this ball cannot be driven more than fifty yards, it calls for a shorter course, and thus makes it possible to play the regular game on abbreviated links.

Any lawn or large lot or old field will do to begin on. The holes may be placed at fifty, seventy-five or one hundred yards apart, and be situated according to the ingenuity or taste of the player or players.

Where the ground will permit it the wooden clubs should be used, especially if the balls are of soft wood, as the irons split and scar them readily. Yet these balls of wood are so cheap that their destruction is really of small moment.

These balls are not generally on the market, but persons who find it difficult to get them made of cork, will find the pine ones are easily made and might be


58 YDS
33 YDS
60 YDS
THREE HOLE COURSE, LAID OUT IN A VACANT LOT, FOR DEAD BALL GOLF, SOMETIMES CALLED PETTY LINKS GOLF (BECAUSE) IT CAN BE PLAYED ON A VERY SHORT COURSE, YET IT IS REAL GOLF).

turned in any carpenter shop where there is a lathe. Soft white pine will be found to be the lightest and most satisfactory material for a cheap and useful ball. They can be made at a ridiculously low price—say fifteen cents per dozen.

The balls should be about one and three-quarters of an inch in diameter, or a shade

less, and crisscrossed on the surface with the edge of the chisel.

To paint them stick a pin in lightly and submerge in a can of thin enamel paint (white) and suspend by a string attached to the pin till thoroughly dry.

Suggestions for laying off small links will be seen in the accompanying diagrams.

The advantages of this ball are the following :—

No caddy is necessary (though always desirable), as the short distance enables the player to locate his lies easily, and the use of but one club (wooden driver) leaves no bag to carry.

For those seeking economy it can be played at slight expense.

Convenience is its chief recommendation.

It affords both increased practice and exercise.

This ball "lofts" beautifully, and at the start off sails away as promisingly as the heavier ball, so that the eye loses none of the delight experienced in a successful drive.

If it has a disadvantage it will be found in "putting" practice, where its lightness may prove disappointing at first.

But, taken all together, the dead ball is a real discovery, and will meet with favor and prove a boon generally.

Aerial Archery Game.

Shooting at artificial birds with bows and arrows is a new sport. The target in such cases is at the top of a pole, which is about ninety feet in height, and it is composed of a series of small wooden birds, into which feathers have been deftly stuck and which are securely fitted into a rack or frame. One of the birds is a little higher than the others and is known as the cock. The aim of the archers is to dislodge all the birds, and when this is done the rack is let down to the ground and a new target is placed in it.

In order to become skilled at this sport long practice and exceptional keenness of sight are necessary. Moreover, as the birds are fastened very firmly in the rack, unusually strong bows must be used to dislodge them, and such bows can only be handled by men of considerable strength.

The arrows used for this purpose, instead of terminating in a point in the ordinary manner, have at the end a piece of horn shaped like a bullet. While the game is going on a man collects the arrows that have fallen, and, in order to protect himself from being injured by those in the air, he wears an immense hat, made of wicker work, the brim of which is an admirable safeguard for his head, shoulders and back.

It is estimated that in France alone there are thirty thousand men who practise archery and who belong to societies devoted to this sport. These societies hold a tournament every year, at which handsome prizes are offered in competition. Archers from all

parts of the country attend on such occasions, and, while some display their skill in shooting at the ordinary target, others elicit admiration by the skill with which they knock from their pedestals artificial birds that are ninety feet up in the air. Indeed, no archer at any of these tournaments wins more admiration than the man who dis-

lodges the topmost bird, the cock, from his lofty perch.

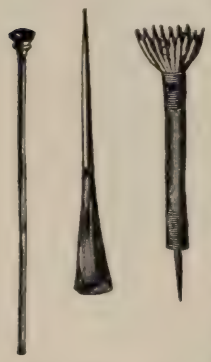
Puff and Dart.

This is a weapon of warfare—and a terrible one too—reduced to the condition of a toy.

Strictly the game consists in blowing a dart out of a tube like an enlarged pea-shooter at a target similar in arrangement to that used in archery, but, of course, much smaller; but the tube may also be used and do much execution with clay pellets instead of the darts. For this purpose the tube is much used by the youth of Paris and other towns in France, and tubes form a regular article of sale in the toy-shops, where they may be had of all degrees of excellence, from the simple, roughly got up metal tube to the highly finished production—a piece of bamboo with a copper tube running through the centre, with a screw top and ferule to protect it when not in use, exactly like our walking-stick fishing-rods.

The natives of Borneo and of the tropical parts of South America use tubes and darts as weapons of warfare and the chase; but the tubes are of much greater length, ranging up to ten or even twelve feet; and the darts, quite insignificant in size, derive their whole efficacy from the terrible poison in which their points are dipped—a poison so deadly that a mere flesh wound is sufficient to seal the doom of man or beast.

Very efficient darts for all the purposes of the game may be made as follows: Get a few penholder sticks, and cut them into lengths of about two inches; next take some worsted, and bind it firmly to the end of each stick, leaving a series of loops projecting beyond; the exact quantity for each dart must be ascertained by experiment. Now for the spike. Take a common brad, file up the sharp end into a good point, not too fine; dip the point into the grease of a candle, and hold it in the flame till it is nearly red hot, and then plunge it into cold water; this will harden it. Now file off the projecting piece of metal at the end, and, having bored a hole somewhat too small in the end of your stick, force the blunt end of the nail into it, and then bind it round firmly with waxed thread. A little sealing-wax varnish over all will both improve its appearance and add to the strength of the binding. Now trim the worsted off carefully with a pair of scissors, and your dart is complete; a far better one, too, than those ordinarily sold in the shops. Such a dart from a three-foot tube will go through an almost incredible number of sheets of paper at ten or twelve paces distance, and will, if carefully made, fly with wonderful accuracy.



There is, however, a kind of dart you may buy in the shops, which is far superior to anything likely to be produced by home work. It consists of a sharp, bayonet-shaped steel spike, almost two inches in length, fitted into the smaller end of a funnel-shaped piece of gutta-percha (see figure). The gutta-percha, being thin, readily takes the shape of the bore, and the cavity gives an extraordinary purchase for the action of the wind.

Ring the Bull.

This amusing game requires more care and delicacy of touch than at first seems to be the case.

The apparatus of the game is very simple, consisting of a bull's head painted on a board, with a hook in its nose and another on each horn. In the top of the board is fixed a horizontal rod, to the end of which is suspended a ring by a piece of string. The players stand in succession in front of the bull, take the ring and try to fling it so that

it shall be caught on the nook in the bull's nose. Each player has nine throws, and he who succeeds the greatest number of times wins the game.

It is tolerably easy to throw the ring on the hook, but not easy to throw it so that it shall stay there, and the "knack" of the game consists in throwing it with just sufficient force to reach the hook.

In another modification of the game the string is lengthened to twelve or fifteen feet, and has a slip-noose at the end. The other end of the string is not fastened to the end of the horizontal rod, but held in the left hand, while with the right the player tries to throw the loop over the two hooks in the bull's horns. If he can catch them both he scores two, and if he catches only one of them, he scores one. Each player has six throws.

Jack's Alive.

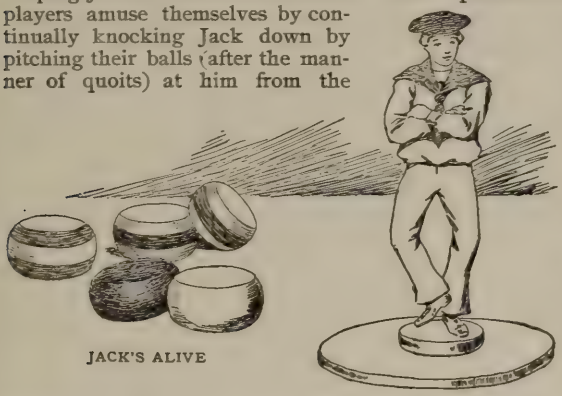
In this very amusing game little is required except the Jack, i. e., the figure of a sailor cast in metal so as to be very heavy, a number of colored balls, and three drawing-pins.

Before commencing the game the three drawing-pins are stuck into the floor in a line, the Jack being placed on the central pin, which is generally some five paces from each of the others. The whole of the space behind the line of the three pins is called "Jack's ground." Sometimes the game is played on a lawn, and in this case three wooden pegs are substituted for the drawing-pins. The following are the rules, as

entered at Stationer's Hall, London, England, by Messrs. Jaques & Son:

LAWS AND INSTRUCTIONS.—The game of Jack's Alive can be played by eight or a lesser number of players; each player to take a ball of distinctive color, and retain it during the game; Jack to be placed upon his stand ten or twelve yards from the throwing point.

These points settled, each player stations himself at the starting-peg and pitches his ball toward Jack. The unlucky player whose ball shall be decided to be the greatest distance from Jack becomes "Jack's master." The game now begins. Jack's master has the active duty to perform of keeping Jack on his stand whilst the other players amuse themselves by continually knocking Jack down by pitching their balls (after the manner of quoits) at him from the starting-point. Every time Jack is knocked off his stand that player scores one.



JACK'S ALIVE

When a player has delivered his ball he has then to fetch it back to the starting-point; in so doing he must pass within either of the pegs defining Jack's ground.

If Jack's master capture any player in returning to the starting-point whilst Jack is alive, or on his stand, that player becomes Jack's master. Jack is alive when on his stand; but if knocked off he is dead; and, when dead, any player can return with his ball to the starting-point with safety.

In returning to the starting-point each player must take up his ball fairly with his hand or hands; if he once touch it his ball is alive or in play, and Jack's master can capture the player.

The game may be made twenty-five, fifty, or any number up. If a sweepstake be played for, the player who first scores the number agreed upon as game claims the stake. If all players should have delivered their balls, so that no player remains within the starting-point, Jack's master may in that case—Jack being alive—regain the starting-point if he can, and if he does so before any other player he ceases to be Jack's master. A new master is determined as at first.

Any player going outside the pegs defining Jack's ground in returning to the starting-point is guilty of foul play.

Any attempt to remove the balls by kicking or other means than the one above expressed is foul.

Any player detected at foul play must at once become Jack's master; and in all cases of dispute the matter must be instantly decided "fair" or "foul" by a show of hands of all the players.

When Jack is replaced upon his stand, the next player, before delivering his ball, must call out "Play."

Modifications of these rules can be arranged and agreed to, but they should be clearly understood at the commencement of the game. This exciting pastime can be played almost anywhere if there be space enough. It requires no previous tuition, and it invariably provokes laughter and good spirits; the exercise, though not fatiguing, is sufficient to produce good health.

Royal Star.

This game is useful in testing accuracy of eye and aim, and is very popular with English boys, though almost unknown in this country.

The machinery of the game consists of a large wooden star with eight long rays, each painted of a different color. The rays are not fastened but their bases are merely slipped into grooves in the body of the star, so that they can be easily knocked out.

There are also eight wooden balls, colored to correspond with the rays of the star. In

order to play the game, each player takes the balls, and, standing at a specified distance, throws them at the star, so as to knock out the rays. If he succeeds in striking out a ray of the same color as the ball, he scores two points; but if the ray and ball are of different colors, he scores one point. If he should miss the star altogether, three points are deducted from his score.

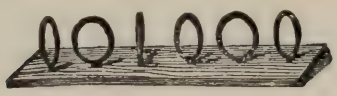
When he has thrown the eight balls, the rays are replaced and the next player takes the balls.

Sometimes each player plays a counter into a pool, and instead of deducting three points from his score when he misses the star, he pays three counters into the pool.

When this game is played, a curtain should be arranged behind the star to stop the balls.

Revolving Ring.

This game is played something like lawn billiards, except that there are six revolving rings instead of one, and that the ball is thrown and not pushed with a cue. As in the previous game, the rings and balls are painted of corresponding colors.



The object of the game is to throw the six balls through the rings, each successful throw counting as three; but when a ball passes through a ring of its own color the player scores six.

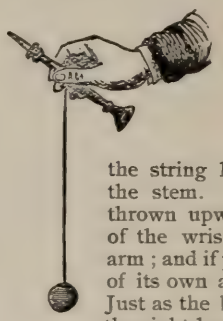
This game is best played by having a pool, as mentioned in the royal star.

Cup and Ball.

In this game there is no infusion of chance, the whole interest lying in the dexterity of the player.

The cup is a piece of wood or ivory, with a point at one end, and a cup—the shallower and smaller the better—at the other. The ball is solid, with the exception of a hole, which ought to be just large enough to receive the point, and no larger. The ball is connected with the stem of the cup by means of a string, which, if possible, should be of soft silk, so as to avoid "kinking," which is obstructive to all play.

The learner should begin with catching the ball in the cup. He should take the stem by the middle, taking care to hold it as lightly as possible between the ends of the fingers and thumb, and not to grasp it firmly. Many good players pass the string over the forefinger; but we believe, after long experience, that the ball can be thrown more accurately, if the string hangs directly from the stem. The ball should be thrown upward by a slight jerk of the wrist, not of the whole arm; and if properly done, it falls of its own accord into the cup. Just as the ball touches the cup, the right hand should be allowed to drop a little; otherwise the ball, though it may fall into the cup, will roll out again.



When the player can make sure of catching the ball in this manner, he should hold the stem by the very point between the forefinger and thumb, and practice catching the ball as before. He will find this rather difficult as the cup is apt to yield to one side or the other, and so let the ball roll out. In order to avoid this, the cup should be rather *balanced* than held, so that it is perfectly upright when the ball comes into it.

The next feature is to *swing* the ball into the cup instead of throwing it; and the most difficult feat that can be accomplished with the cup is to jerk the ball into the air as usual, and then rapidly pass the cup under the left wrist, so that when the ball settles in the cup the wrist is encircled by the string. A good player ought to be able to catch the ball in the cup with his eyes shut.

Now we come to catching the ball on the point, which is a very difficult matter, and yet, difficult as it may seem, a moderate player ought to succeed ten times in twelve.

In order to do this properly, hold the stem as represented in the illustration, and with the fingers of the right hand give the ball a smart spin. Let it spin as far as it

can in one direction, and allow it to spin back again for ten or twelve times; watch that it is quite steady, and then throw it up as before. Turn the point upward as if you were aiming at the spot where the string enters the ball, and just as the ball touches the point let your hand sink slightly.

If this be done properly, the ball settles itself on the point almost mechanically, and the proof of a really good catch is that the ball revolves several times after it has been caught.

This game is invaluable for giving lightness of touch, dexterity of hand and quickness of eye.

The Whizzer.

Get a circular piece of tin, three inches or more in diameter, and cut it round the edges in the form of a star. Bore two

holes through it about an inch and a half apart; pass the two ends of a string through the holes; tie them, and the toy is complete. When the tin star cannot be procured, a big button will serve the purpose admirably.

Hold an end of the double string in each hand, as seen in the illustration, and spin the tin star, or "whizzer" as we shall call it, until the string is twisted as far as it will bear. Now separate the hands, and the whizzer will revolve rapidly, and, when the hands are stretched wide, will come to rest as shown in the illustration.

But if, instead of allowing the hands to reach their fullest extent and to remain there, they are brought gradually together again, the cutter will revolve in the opposite direction, and wind itself up again. Thus it may be made to wind and unwind itself as long as the player likes.

Lawn Cupolette.

This game is played by means of seven pins, made so that they may either be driven into the ground or fixed on a board. Each pin is numbered, from one to seven. There is a slight cup at the top of the pins. In each cup is placed a small ball or marble.

To play the game, six of the pins are fixed in a circle, with the seventh in the

middle; and the players, standing at a given distance, take the wooden quoits, with which they try to knock the balls out of the cups. Before playing, they must name the pin at which they aim, and if they strike off the ball belonging to any other pin, the score goes to the adversary. If, however, he knocks off the ball at which he aims, and by the same throw strikes off one or more besides, he may score them all.

In another version of the game, if the player can strike off the seven balls and have one or more quoits to spare, he may try to throw the quoits so as to fall upon the pins, and for every case in which he succeeds he adds the number of the pin to his score.

Parlor Ringolette.

This game, as seen from the illustration, is played with pegs which can be fastened firmly into a board, and with a corresponding number of wooden rings or quoits. When the pegs are set in their places, the first player takes the quoits and, standing at a specified distance, endeavors to throw the rings over the pegs. For every ring that fairly encircles a peg the thrower scores the number which is attached to the peg; but

should more than one ring fall on the same peg, the score goes to the opponent.

In this, as in all games where a ring has to be thrown, the ring should be held just

like a quoit, so that a spin may be communicated to it and make it fly steadily to its mark.

RULES.—1. The game of Ringolette is adapted for two or more players.

2. The first player being decided upon, he places the board in the centre of the table, and standing about three feet or more from the board, commences his play.

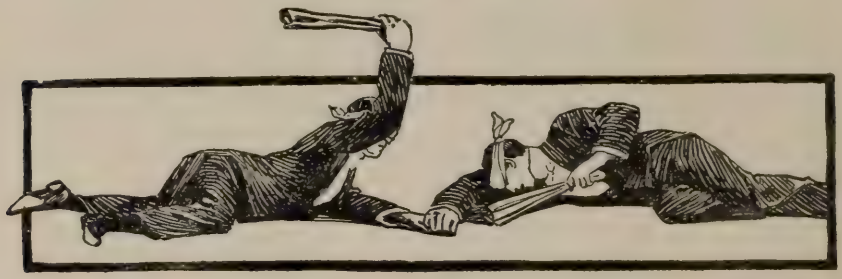
3. Each player takes the eight rings, and plays by pitching the rings on the pegs.

4. Each ring that is fairly on the pegs counts according to the number indicated on the board.

5. Should a player place more than one ring on each peg, it scores to the opposition.

6. Three-score and one is a medium game; five-score and one a long game.

These rules may be modified by agreement among the players, but not otherwise.



The New Cudgel Game.

Here is a new game, which is causing a great deal of amusement at social gatherings in Europe.

Two boys, or young men, are blindfolded, and in the right hand of each is placed a stout roll of paper in the form of a club or cudgel. The players then have to lie down on the carpet and to grasp each other by the left hand. Thereupon the fun begins. One of the players asks the other:—

"Are you there?"

When the answer "Yes" comes he raises his right hand and strives to hit with his cudgel the spot where, from the sound of the voice, he supposes the other player's head to be.

The other player, however, is at perfect liberty to move his head after he has answered "Yes," and the result is that in nine cases out of ten the blow misses his head and falls on his shoulders or some other part of his body.

In that case it is his turn to retaliate, and so the game goes on indefinitely, the sole object of the player who asks the question being to strike the other player's head, and that of the player who answers to save his head from being struck.

Stage-Coach.

This game depends entirely for its spirit upon the inventive faculties of the person who tells the story upon which the game hinges.

The players sit in a circle, and all but the story-teller take names, each of some part of the coach or its equipment: door, step, boot, wheels, coachman, horses, traces, etc.

The storyteller—when all are ready and know their respective names—begins a long tale about the adventures of this old coach, bringing it to all sorts of grief, and making the story as humorous as possible. The story ought to be told fluently, but not too fast to be readily followed by the audience. Every time any part of the coach is mentioned, the player who has assumed its name must rise from his seat and sit down again, under penalty of a forfeit; and every time the old coach is mentioned, the whole party, with the exception of the story-teller, must do likewise.

"My Lady's Toilet"

Somewhat like "Stage-coach." Each player represents some article of the toilet—brush, comb, soap, perfume, brooch, etc.—

and the lady's maid stands in the middle of the circle, and calls for any article the lady is supposed to want. The personator of that article must then jump up, or be fined a forfeit for negligence. Every now and then the abigail announces that her lady wants her whole toilet, when the whole circle of players must rise and change places. The lady's maid herself makes a bolt for a chair, and the player who is left chairless in the scuffle becomes lady's maid.

Jackstraws.

This is a game of pure manual dexterity, and is rare practice for cultivating steadiness of hand and delicacy of touch.

Its worst fault is that in the very nature of the game a constant series of deadlocks are inevitable, only to be overcome by the self-sacrifice of one or other of the players.

Jackstraws are a number of thin narrow slips of wood, bone or ivory, each more or less notched, sometimes cut into fantastic shapes, and numbered.

These being held together in a bundle, are allowed to fall on the table, and the players, two or more in number, each in turn pull them out one by one with a small hook. As long as a player can go on abstracting from the heap, without in any way shaking or disturbing more than one jackstraw at the time, his turn continues, and all he thus secures he keeps; at the least shake his turn ceases, and the next player goes on.

When all the jackstraws have been thus abstracted, each player counts his heap, each jackstraw being valued at the number inscribed on it, and he who has most wins.

German Dwarf.

This is a capital deception, and, if well carried out, one sure to please the spectators, who, unless they are in the secret, will try in vain to solve the mystery.

To produce this entertaining illusion two persons only are absolutely necessary, but the assistance and co-operation of a third will prove of great service both in making preliminary preparations and in carrying out the deception.

The other requisites are a table, of the dressing-table character, with a long cloth sweeping the ground, and a pair of curtains.

These curtains must be hung over the doorway between the two rooms, or at the opening of some suitable recess, and the

table, with its cloth so arranged as to allow no one to see underneath it, must be placed in front.

The exhibition should be held, if possible, in a separate room, from which the public must be rigorously excluded whilst the dwarf is being "got up." If, however, this be not practicable, another curtain should be brought over the front of the table until the dwarf is in his place; in fact, in either case a double set of curtains, one in front and the other behind the table, is a great advantage.

The dwarf is managed thus: The taller of the two chosen to enact that part carefully

disguises his face with a wig, a false mustache and beard, and a liberal application of burnt cork and rouge, and having divested himself of his coat, pulls over his hands and arms a pair of stockings, which should be of some bright color—preferably scarlet—and over them a pair of shoes, ornamented at the instep with enormous buckles or rosettes.

The shorter of the two then standing behind him, thrusts his arms as far as they will go under his confederate's armpits, and a kind of tunic or other suitable garment is brought over all.

This tunic, of course, must be made for the purpose, and should be as extravagant as possible in color and cut: a good-sized crimped frill or enormous turn-down collar is very effective.

Thus arrayed, the first-mentioned, standing behind the table, places his shoe-clad hands upon it, which thus represent the feet of the dwarf, and the curtains, which are fastened together a few inches above his head, are drawn apart so as just to reveal what appears to be the body of a dwarf with a most disproportioned head. By the way, a boy with a big head should generally be selected for this part, and its size should be exaggerated by art.

He must remember to lean slightly over the table; in fact, he should stand in the attitude of a man making an after-dinner speech, or the legs will not appear to support the body, and thus much of the likeness to a freak will be destroyed.

The third accomplice, who also undertakes the part of showman, must now admit the public, and introduce to them his wonderful *lusus naturæ*.

The part of showman is, perhaps, the most important of the three, for upon his wit and readiness will depend all the real fun of the affair; the dwarf by itself can be but an object of passing curiosity, unless occasion be taken to make it a peg to hang some fun upon.

It is impossible for us to put words into the showman's mouth; we would only advise him to get up his "patter," as the showman's talk is called, as far as possible beforehand, imitating and parodying the regular professional giant and dwarf showman to the best of his ability.

Of course, the more ridiculous and impossible his statements are the better. His history, geography, etc., should be hopelessly at fault. A very good plan is to describe his dwarf as a thousand years old, and make him take part in the most incongruous historical events, jumbling up persons, localities and dates in hopeless confusion.

This "patter" must be poured out in one continuous stream, and with perfect confidence and self-possession, or it loses half its attraction.

Both dwarf and showman, if they want to produce a really striking effect, must practice their parts together for some time previously.

If the dwarf can get up a dance, or play a short tune upon a penny whistle, or perform some other similar feat, it will add much to the success of the show.

This whistle business is difficult at first, because the hands do not belong to the owner of the mouth, and they must be guided by feeling alone, for their owner cannot see anything; but the difficulty *may* be overcome, and that without very much demand upon the learner's patience.

He who does the head and legs' part must be careful not to forget his part: a momentary forgetfulness may betray him into the most ludicrous mistakes.

The writer's brother one day, while officiating in this capacity, was suddenly afflicted with an intense itching of the nose. Momentarily oblivious of his part, he lifted his shoe-clad hand to his nose to scratch the seat of irritation, an action that, of course, raised shouts of laughter from the audience, for the dwarf appeared to be "taking a sight," not with his thumb and fingers, but with his toes.

Fortunately the spectators looked upon this as part of the performance, and were proportionately delighted; but similar mistakes may not prove equally fortunate.

A Spectre Lamp: A Party Pastime.

Here is a trick which is always very effective at a party or any gathering of young people, and sometimes with older persons, too.

Take a tin cup, or a cup of some other metal, and fill it almost full of spirits of

wine, into this put a teaspoonful of common table salt and stir it thoroughly until the salt is dissolved. Place this upon a wire frame and fix the frame over a spirit lamp, or a dark lantern, so that none of the light from the lantern can shine into any part of the room. This should be done in one end of the room and the company seated in a line as near the centre of the room as possible for convenience to all.

As soon as the cup gets so hot that you cannot rest the tip of your finger against it, will lose all its previous tint and become a ghastly solid yellow.

You will hardly be able to recognize your little friends, and they will scarcely know you. Their hair, faces, clothes, the chairs they sit on and all the rest of the furniture, the carpet, in fact, everything in the room will look as if it had suddenly received a thick coat of yellow paint. This is a very quick way of changing brunettes to blondes, and there will not be a single laddie or lassie with raven tresses in the room.

THE SPECTRE LAMP

hold a lighted match near the mixture of spirits of wine and salt. A very small yellow flame will arise from the surface and gradually increase in size. Now put out the other light in the room and in a moment you will observe a most peculiar effect. Everything in the room, whatever its previous color, will now be a most positive yellow. If the yellow light from the cup is not quite strong enough, throw some more salt in the mixture and then the yellow flames will be still stronger in color. Reds, blues, blacks, whites, greens, everything

Now place an ordinary light at the extreme other end of the room, and the effect will be two lights, one white and the other yellow. You must be careful not to have the white light stronger than the yellow one, and then while one-half of each will appear in its proper colors, the other half will still be a vivid yellow and the dividing lines will be sharply defined.

To get the best effect of this you and your friends should be seated in two lines facing each other, with a light on each end of the lines.

A little girl with black hair and a gray dress, for instance, will present a most peculiar appearance—looking perfectly natural on one side, while on the other side she will be yellow from head to toe.

Fright.

This is a very lively game, with plenty of fun and excitement in it. It is played as follows :

Supposing there be twelve players, one is chosen as leader ; ten chairs are then placed in a row, facing different ways, alternately back and front, and the remaining eleven players range themselves in a line round them, with their right sides to the chairs. The leader now gives the word "Slow march!" upon which they march in slow time round the chairs in single file ; "Quick march!" and then "Slow march!" again, until, watching his opportunity when they are least prepared, he shouts out, "Halt!" At this word they must all endeavor to sit down, and as only one may occupy one chair, and as there are only ten chairs for eleven would-be-sitters, one must necessarily be "left out in the cold."

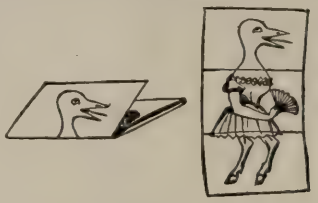
This fate entails a forfeit ; the struggle, therefore, for seats is very exciting, for none is willing to be the "old man out," and *sauve qui peut*—each one for himself—is the order of the day. The arrangement of the chairs alternately back and front adds amazingly to the perplexity of the unfortunate member in search of a seat, and it is very amusing to notice how lovingly the crafty ones cling to the chairs which have their seats towards them, how carefully they eschew the backs—how it takes at least three steps to pass the former, while the latter are easily cleared in one.

It adds very much to the spirit of the game, and indeed improves it very much in every way, if, instead of having a leader, a march is played on the piano. The players must keep time to the music, and its cessation is the signal to be seated. A good pianist will lead the players a pretty life, trying them with all sorts of time, and involving them in all sorts of troubles. A very effective plan is to make pretense with a good sounding chord or two of coming to a full stop, and then dart off into a lively quick march. One or two of the extra sharp players are sure to be taken in, and to make a dart for seats ; give them just time to get out of their seats and rejoin the ranks, and then, while they are yet covered with confusion, and demoralized by their mistake, stop in right earnest. A "heavy bag" may be looked upon as a certainty.

Head, Body and Legs.

This is a very amusing game, and will afford an almost endless fund of amusement.

Though it is a drawing game, yet it does not require that the players should be artists, or even in the ordinary sense be able to draw ; a mere faculty—which nearly all



schoolboys possess—of being able to scrawl some distant resemblance to a living creature is all that is necessary ; in fact, the worse the drawing of the several parts the more amusing is commonly the result of the whole. The most approved method of procedure is as follows :

Three or more players sit round a table, each with a sheet of paper folded into three, and a pencil. Each draws a head, of man, of beast, of fish, etc., according to the fancy of the moment, on the upper third, carrying the lines of the neck just over the fold as a guide to the next artist, and folds it down, and then passes it to his left-hand neighbor.

Each then, on this new paper, draws a body, working from the lines of the neck above mentioned, but, of course, in total ignorance of the nature of the head thereto belonging, carries the lines over the next fold, doubles down, and passes the paper as before.

Each now, working from the lines brought over, affixes a pair of legs—the more eccentric the better—to the unknown body. The papers are then passed to the chairman who

opens them and shows them for public inspection. The combinations produced in this way are most extraordinary, and often raise shouts of laughter.

The illustration is a facsimile of a drawing thus produced while describing the game to the draughtsman.

The Giant.

This may be done in two ways: first and most difficult, by one boy standing on another's shoulders, and then putting over both a long loose garment, long enough to reach to the knees of the lower one.

This method, however, may be made much more easy by the upper player putting his feet in a kind of stirrup fastened to straps passing over the under one's shoulder's, and hanging just down to the hips. Height, of course, is sacrificed, but greater safety is secured; the giant, too, can exhibit thus for a longer time, as the attitude is not so fatiguing.

The other and simpler method is to place a huge mask, which should represent a head and neck, on the top of a pole about five feet long, with a cross-piece to represent arms, and then tying a long cloak—it should be made for the purpose: any common material will do—round the neck of the mask and get bodily inside.

Now, by raising or depressing the pole, the giant may be made to attain an extraordinary stature or to shrink down again to ordinary dimensions as well.

The lower end of the cloak, about two feet from the bottom, must be fastened to

the performer's waist, so that when the head is depressed the cloak may fall in folds, and not sweep the ground as it otherwise would.

There is a very entertaining illusion of this sort exhibited under the name of "The Nondescripts." Two figures with enormous heads, alternately giants and dwarfs, run about the circus and indulge in the most surprising vagaries, being able apparently to contort themselves in every imaginable direction.

Their final *coup* is to put their heads deliberately through their legs, and make their exit with their eyes thus looking over their own shoulders.

A Cheap Way of Being Generous.

Take a little common white or beeswax, and stick it on your thumb. Then speaking to a bystander, you show him a dime, and tell him you will put the same into his hand; press it down upon the palm of his hand with your waxed thumb, talking to him the while and looking him in the face. Suddenly take away your thumb, and the coin will adhere to it; then close his hand, and he will be under the impression that he holds the dime, as the sensation caused by the pressing still remains. You may tell him he is at liberty to keep the coin; but on opening his hand to look at it he will find, to his astonishment, that it is gone.

The Famous Mountebank Trick.

In the days when merry-andrews and mountebanks met with a hearty welcome on every English village green no conjuring trick was more popular than this; yet there are few that can be performed with less difficulty. You first of all procure a long strip of paper, or several smaller strips pasted together, two or three inches wide. Color the edges red and blue, and roll up the paper like a reel of ribbon. Before doing so, however, securely paste a small piece of cotton at the end you begin to roll. Then, when the proper time has arrived, you take hold of this cotton, and begin to pull out a long roll which very much resembles "a barber's pole." In order to perform this trick with good effect, have before you some paper shavings, which may easily be procured at any bookbinder's, and commence to appear to eat them. The chewed paper can be removed each time a fresh handful is put into the mouth; and when the proper time and opportunity have arrived, put the roll into the mouth and pull the bit of cotton, when a long roll comes out, as before described, to the astonishment of the audience.

A more elegant but similar feat is the following, which we will style

Bringing Colored Ribbons From the Mouth.

Heap a quantity of finely carded cotton-wool upon a plate, which place before you. At the bottom of this lint, and concealed from the company, you should have several narrow strips of colored ribbons, wound tightly into one roll, so as to occupy but little space. Now begin to appear to eat the lint by putting a handful in your mouth. The first handful can easily be removed and returned to the plate unobserved while the second is being "crammed in." In doing this, care should be taken not to use all the lint, but to leave sufficient to conceal the roll. At the last handfull, take up the roll and push it into your mouth without any lint; then appear to have had enough, and look in a very distressed state, as if you were full to suffocation; then put your hands up to your mouth, get hold of the end of the ribbon and draw, hand over hand yards of ribbon as if from your stomach. The slower this is done the better the effect. When some ribbon is off the roll, your tongue will assist you in pushing another end ready for the hand. You will find you need not wet or damage the ribbons in the least. This is a trick which is frequently performed by one of the cleverest conjurers of the day.

Curious Watch Trick.

By means of this trick, if a person will tell you the hour at which he means to dine, you can tell him the hour at which he means to get up next morning. First ask a person to think of the hour he intends rising on the following morning. When he has done so, bid him place his finger on the hour, on the dial of your watch, at which he intends dining. Then—having requested him to remember the hour of which he first thought

—you mentally add twelve to the hour upon which he has placed his finger, and request him to retrograde counting the hours you mention, whatever that may be, but that he is to commence counting with the hour he thought of from the hour he points at. For example, suppose he thought of rising at eight, and places his finger on twelve as the hour at which he means to dine, you desire him to count back twenty-four hours: beginning at twelve he counts eight, that being the hour he thought of rising, eleven he calls nine, ten he calls ten (mentally, but not aloud), and so on until he has counted twenty-four, at which point he will stop, which will be eight, and he will probably be surprised to find it is the hour he thought of rising at.

Plumes for the Ladies.

The following very clever trick was a favorite with M. Houdin, and was performed by him at St. James's Theatre, where it drew forth a good deal of admiration. When known, however, it appears like a great many other tricks, very simple and easy.

Procure two or three large plumes of feathers, or a lot tied together. Take off your coat and hold one lot in each hand, so that the plumes will be in a line parallel with the arms. Put your coat on again, and press the feathers into small compass. Ask some one to lend you a large silk handkerchief, throw it over one hand and part of the arm, and with the other quickly draw the feathers from that arm. The plumes being released from their imprisonment will spread out and resume their bulky appearance, and the onlookers will be completely baffled as to where they could have come from. Then repeat the process with the other arm.

The Ink and Fish Trick.

This trick, originally introduced by M. Houdin, has been performed by every wizard since. On the table is placed a large goblet containing apparently several pints of ink. A small quantity of ink is taken out with a ladle, and, being poured out into a plate, is handed round to the company to satisfy them that it really is ink. A handkerchief is then covered over the goblet, and upon being instantly withdrawn, reveals the glass now full of water, in which swim gold- and silver-fish. The trick is thus performed: A black silk lining is placed inside the goblet, and kept in its place by a wire ring. It thus forms a bag without a bottom, as it were, and when wet adheres close to the glass in which are the water and the fish. The next part of the deception is the ladle, which must be capable of containing as much ink as will induce the audience to believe that it was got from the goblet before them. The ink must be concealed in the handle of the ladle, so that when it is lying on the table it will not be perceived; but on being elevated, it must run into the ladle, through a small aperture made for the purpose. The black silk is easily withdrawn by the thumb and finger at the time the handkerchief is removed. It must be concealed within the folds of the handkerchief.

Evanescent Money.

"'Tis here, and 'tis gone!" This simple but effective trick is done in the following manner: Stick a small piece of white wax on the nail of your middle finger; lay a dime on the palm of your hand, and state to the company that you will make it vanish at the word of command, at the same time observing that many perform the feat by letting the coin fall into their sleeve; but to convince them that you have not recourse to any such deception, turn up the cuffs of your sleeves. Then close your hand, and by bringing the waxed nail in contact with the piece it will firmly adhere to it. Then blow upon your hand, and cry, "Begone!" and suddenly opening it and extending your palm, you show the dime has vanished.

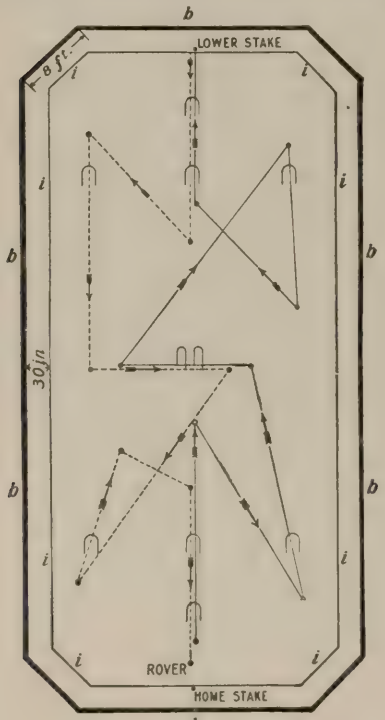
Care must be taken to remove the wax from the coin before you restore it to the owner.

The New Game of Roque.

Roque—pronounced roke—is the perfected game of croquet. Any one familiar with the latter can play roque. Croquet is played with large arches, wooden balls, long-handled mallets, on grass courts. To make it a scientific game the arches were narrowed, involving greater accuracy of stroke. Then came the perfecting of the balls, until

a hard-rubber ball, almost equal to ivory, has been evolved, weighty, steady, and admitting of perfect play. Next came the court, and from a grass court was evolved the present roque court, entirely free from grass, rolled and scraped and slightly sanded.

The length of the court is seventy-two feet and the width thirty-six. This is the regulation size. But provided the proportions are retained a very satisfactory court may be made with a length of sixty feet and a width of thirty. The corners are eight feet inside



THE NEW GAME OF ROQUE

measurement. The outside border, *b*, *b*, in the diagram given, is of timber about six inches by four, laid flat and jointed, against which caroms are made as in billiards. The inside line, *i*, *i*, *i*, is simply a line on the surface made by a marker with a projecting nail point, and is, as indicated upon the diagram, thirty inches from the border. All balls resting nearer than thirty inches to the border are laid out on this line.

THE CONSTRUCTION OF A COURT.—The wickets should be of steel seven-sixteenths of an inch in diameter and three inches and a half between the wires, except the centre arch, which is a double one, eighteen inches from one arch to the other, but only three inches and three-eighths between the wires. The stakes, one inch in diameter but only an inch and a half high, are set just outside the border line.

The first arch is seven feet distant from the border line. Seven feet farther is the second arch. At right angles to the second arch and six feet three inches from the timber border is the third arch. The centre arch is set crosswise of the field at the centre. All the other arches are easily placed because of relative settings.

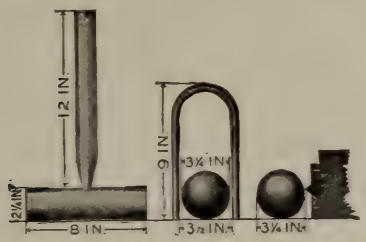
Upon the timber borders a ball readily caroms. But the more perfectly equipped courts are provided with rubber strips placed at the proper height on the timber borders so as to make the caroming of a ball easy. This rubber is generally the discarded rubber of billiard tables.

The natural soil in almost any section is suitable for a court. Sometimes the surface will need grading. It should be as level as the foundation of a house. The early spring is the best time to begin to get the court ready. The upper part for at least two inches should be sifted to make it free from all pebbles, and before the arches are set, or even the border is put down, it should be scraped and rolled, until a twelve or sixteen foot "straight edge" laid in any direction will come in contact with the earth at every point. Then let the timber border be placed by some skilled workman, and lastly set the arches. These are set firmly in heavy blocks of wood at least four inches by six by eight in size and to the depth of four or five inches. A piece of steel, frequently half an inch in diameter, is used. Thirty-two inches long before bending will be ample, leaving the arch about nine or ten inches above the surface.

The arches are set rigidly and earth well packed about them and all made perfectly

level, as the finest and most skillful playing is about the arches.

The balls are of solid rubber three inches and a quarter in diameter, and as the arches, regulation size, are only three inches and a half, it follows that only one-eighth of an



inch is left on each side when the ball is placed in, or passes through, the arch. This gives an idea of the skill required in playing the game. The mallet is about seven inches long, with a short handle.

How the Game is Played. — The course of the balls may be gathered from the diagram given by observing the direction of the arrow-marked lines.

The game is begun and continued as follows, invariably only two persons playing, each with two balls. The order of the colors is red, white, blue, black. Red and blue are partners, also white and black.

Suppose red has the choice of play. The red ball will be placed at either corner, as desired, at the head of the field; its partner, blue, being diagonally opposite. White will be placed at the corner across the field from red, and black diagonally opposite white. Red can begin the game by playing at any other ball, as they are all in play. Generally he plays for a ball at the lower end of the field, and, of course, has to bring them up before he or his partner can make the first arch. In case he cannot do this he will try to hide the next player (white) behind some wicket, so as to make it difficult for white to gain the balls. If red could not make progress he would leave the balls as favorably located as possible for his partner, blue, who, after white's failure to gain the balls, would commence his run of the arches, and bring white into play, too, if it rested at the lower end of the field. Blue makes the first, the second and the third arches in the usual way by using the other balls, and as black is now the "danger-ball" he leaves it hidden behind the third arch after passing it, and having previously placed a ball at the centre he now utilizes this in making the difficult centre arch. Each succeeding arch made requires a repetition of similar tactics, till red and blue, or black and white, become rovers.

EXERCISES FOR DEVELOPING THE BODY AND PRESERVING THE HEALTH

It is only recently that people generally have begun to realize the importance of regular exercise for the development of the body and the preservation of the health. We are beginning to feel that it is *a sin* to be sick. Physicians tell us that one-half of the sickness is due to the sin of over-eating, and almost the entire other half is due to the lack of properly exercising the body.

There is a story in the Arabian Nights Tales of a king who had long languished under an illness, and had taken an abundance of remedies to no purpose. At length, says the fable, a physician cured him by the following method: He took a hollow ball of wood and filled it with several drugs, closing it up artificially. He also took a mall, and having hollowed the handle and that part of the mall which was used to strike the ball, enclosed in them such other drugs as had been usually administered to the patient. He then ordered the sultan, who happened to be this distinguished patient, to exercise himself in the morning by striking the ball with this mall until he should be in a vigorous perspiration. The ignorant sultan thought it was the drugs that cured him, but the wise physician knew it was the exercise. He only placed the drugs in the ball and the mall because the sultan had the faith in them necessary to induce the laborious exercise which alone could cure him.

The moral of this story is, there ought to be regular exercise every day in some systematic manner. The great majority of mankind have not the time or opportunity to join in athletic games or attend gymnasiums; but physical culturists have discovered that a simple system of home training, without apparatus, may accomplish for the body nearly all the good results of the gymnasium.

The following simple exercises, practiced by male or female, in their private apartments every morning, or better still, where it can be so arranged, by the whole family, once a day in concert (to the strength limit of the weakest, the stronger members continuing individually until their requirements are met) will prove not only a health-producing, doctor-bill-preventing exercise, but a very pleasing pastime as well, in which the boys and girls and older members of the family will take delight. But these home gymnastics, if they are to be decided benefits, must be performed with persistent regularity, and the mind of the child should be trained to feel like they must be taken like the food, every day, and they should no more be missed than one of the meals.

The average length of time for these exercises should be about half an hour, or even less according to the strength. Very strong persons may extend it to an hour, and the practice should be so long persisted in, that it grows into one of the habits of life. Those who look for striking results in a very short practice are doomed to disappointment, while persistence in these exercises will make strong and healthy men and women out of the weakest and most delicate children. Regularity in exercises will bring good result.

President Roosevelt, one of the most vigorous and enduring of men, was so weak when he was a child that he could not be sent to the public schools. He recognized his weakness, and began a regular system of exercises in the open air, which each day grew more strenuous as his vigor and endurance increased. He is a prominent example of what exercise, properly taken and persistently indulged in, will do for a weak and delicate constitution.

We recommend to those about to enter upon the following course of movements to memorize the brief instructions which accompany them, and to decide for themselves the number of times that each movement is to be taken, and then with strict attention persistently discipline themselves to take these movements a definite number of times each day, increasing as you grow stronger.

While the movements are being taken, the muscles as a rule should be tense, and the number of movements which are to be taken should be governed by the physical condition of the performer, ceasing when a moderate fatigue is arrived at, never continued until complete exhaustion. The stomach should be as empty as possible when the exercise is begun, and the dress should be comfortable and easy, leaving the movements free and unimpeded by the clothing. The neck and arms should be bare, or covered with very light garments, and females should avoid the use of stays or heavy skirts.

Fig. 1. Head Bending Sidewise.

Exercises for the Head and Neck.

a. HEAD TORSION. Stand in erect position; turn the head alternately to the right and left, looking first over one shoulder and then over the other. Hold the shoulders perfectly straight and avoid moving them.

b. HEAD BENDING. First, forward and backward. The head is bent forward as far as possible, so the chin touches the chest lightly, in a regular steady movement. The chin remains a moment on the chest, and is then raised until it is again erect. Next it is bent backward as far as possible, and raised to an erect position. Repeat several times.

c. HEADBENDING SIDEWISE (Fig. 1.) The head is bent exactly in the direction indicated in Fig. 1, without twisting and without lifting the shoulders on one side or lowering on the other.

d. HEAD ROTATION. The head is bent forward, then turned sidewise to the left, then backwards, then sidewise to the right and again forward. The movement must be made in a regular steady manner.

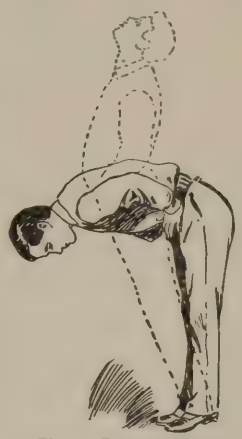


Fig. 2. Trunk Bending Forward and Backward.

Exercises for the Trunk.

a. TRUNK BENDING FORWARD AND BACKWARD (Fig. 2.) Hold the legs rigidly, place the hands firmly on the hips as in Fig. 2. First the head is bent forward and backward, then the trunk is moved quickly in the same direction, the angle being

Fig. 3. Trunk Bending Sidewise.

formed at the hip joints, without bending the body or moving the legs. (See Fig. 2.) The shoulders should not be moved out of their position. The stretching should be done slowly.

b. Trunk Bending Sidewise (Fig. 3.) With the hands resting on the hips the head

Fig. 4. Arm Raising.

is bent sidewise to the right and left, then the trunk follows in the same direction as far as possible, without lifting the opposite foot. (See Fig. 3.) Avoid twisting the head or changing the position of the shoulders or hips.

c. Trunk Rotation. The trunk is bent forward, and then, without straightening it again, sidewise to the left and then backward and sidewise to the right, or in reverse order, then again forward, and so on. The movements in this exercise should be quick.

Shoulder and Arm Movements.

a. Shoulder Movements. Hands on hips. Both shoulders are first moved forward easily, and then drawn backward vigorously, the elbows simultaneously with the shoulders are moved forward and backward as far as possible. Take a deep breath as the shoulders are moved backward, and expel it, sinking the chest as much as possible, as they are moved forward.

b. Arm Raising Sidewise (Fig. 4.) Stand erect, arms hanging straight at side; holding them at full length raise them straight out from the side steadily, until they reach a vertical position, as shown in Fig. 4. Observe not to twist or bend the arms. While they are vertical, the palms are turned outwards and the backs of the hands toward each other. Hold the fingers together as shown in the figure. In this position the arms should be raised and lowered slowly, the muscles being tense, a deep breath taken as they are raised and expelled slowly while being lowered.

c. Arm Spreading. First raise the arms forward into a horizontal position. Starting from this the arms are moved outward and backward, then again forward without being lowered, until they are in the same position as at the beginning, with the hands touching,

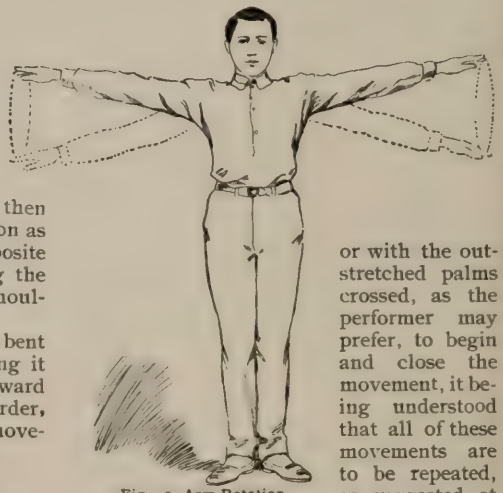


Fig. 5. Arm Rotation.

or with the outstretched palms crossed, as the performer may prefer, to begin and close the movement, it being understood that all of these movements are to be repeated, as suggested at the beginning, according to the strength of the operator.

d. Arm Rotation (Fig. 5.) Assume the position of Fig. 5, except that the arms make

a perfect right angle from the shoulders. Then whirl them by moderately rapid motion, so as to describe a circle, as shown in the figure, the center of the circle being always even with the height of the shoulders, and the back of the hands always turned upward as shown in the figure.

e. THE MILL (Fig. 6.) The mill is an extension of the last movement, or arm rotation, into larger circles, and is performed in a continuous motion, backward as well as forward, by whirling the arms around in large circles, as shown in the figure,

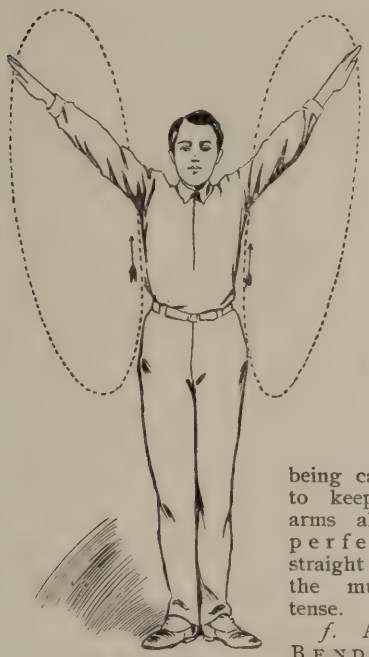


Fig. 6. The Mill.

being careful to keep the arms always perfectly straight and the muscles tense.

f. ARM BENDING, STRETCHING (Fig. 7.) With the elbows resting against the sides, the forearms are drawn up so the fists touch the shoulders, as shown in the figure. In this bent position the arms are vigorously stretched upward, forward, sidewise, backward and downward,

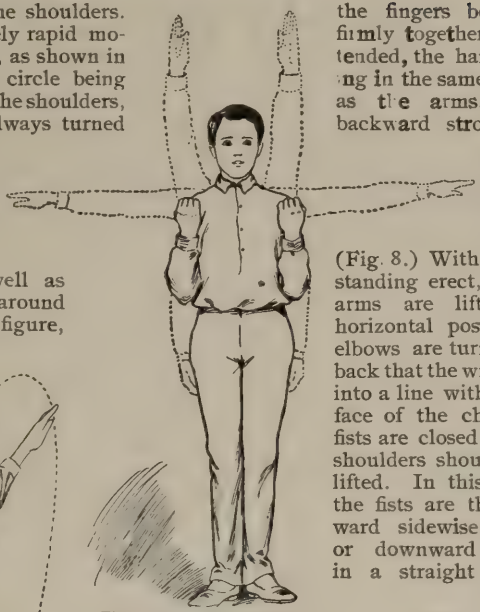


Fig. 7. Arm Bending and Stretching.

stretching the arms quickly and vigorously. In order to do the thrusting downward energetically, the elbows should first be lifted upwards, as in Fig. 8. Then the thrust follows.

h. BEATING WITH THE FOREARM IN RAISED

the fingers being held firmly together and extended, the hands pointing in the same direction as the arms. In the backward stroke avoid bending the trunk.

g. ARM THRUST (Fig. 8.) With the figure standing erect, the forearms are lifted to a horizontal position, the elbows are turned so far back that the wrists come into a line with the surface of the chest; the fists are closed, and the shoulders should not be lifted. In this position the fists are thrust forward sidewise, upward or downward (always in a straight line) by

Fig. 8. Arm Thrusting.

Fig. 9. Beating with Forearm in Raised Position.

Position (Fig. 9.) The arms are raised sidewise into a horizontal position, backs of hands upward, forearms bent forward until the ends of the fingers touch. In this position the arms are moved slowly as far backward as possible on a level with each other and at full stretch. They may be moved slowly or with a swinging motion. If desired, the hands may be closed into fists. This is an excellent exercise for warming the blood. In an improper manner we frequently see it done on cold days by car drivers, and others who are exposed to the weather.

Fig. 11. Leg Raising Sidewise.

i. Hand Bending and Stretching (Fig. 10.) The arms are fully extended sidewise as in Fig. 10 (or forward to vary the shoulder support), the backs of the hands being turned upward. In this position the operator bends the hand upward in direction of the backs of the hands, and then downward in direction of the palms as far as possible, and follows with an equal number of sidewise bendings alternately toward the thumb and toward the little finger.

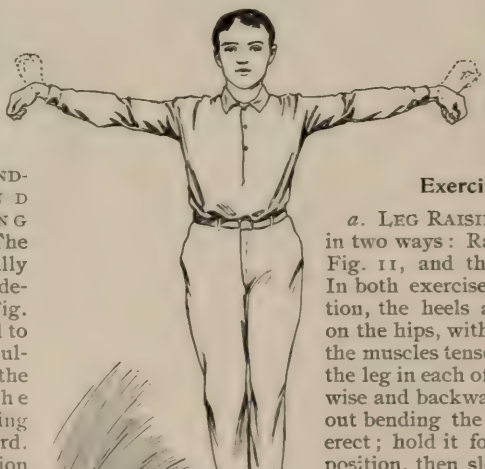


Fig. 10. Hand Bending and Stretching.

Exercises for the Legs.

a. Leg Raising (Fig. 11), should be done in two ways: Raising the leg sidewise as in Fig. 11, and then backward and forward. In both exercises, begin with an erect position, the heels always touching, the hands on the hips, with the leg fully stretched, and the muscles tense. Stiffening the knee raise the leg in each of the directions named (sidewise and backward) as far as possible, without bending the body, which must be kept erect; hold it for a moment in this raised position, then slowly lower it.

b. Leg Swinging Forward and Backward (Fig. 12.) Placing the hand on the back of a chair to steady the body, as shown in figure, first one leg and then the other is swung energetically forward past the other

leg, and then backward with equal force. In this exercise great care should be observed to hold the swinging foot so that the toes are pointed slightly downward and outward.

c. LEG TORSION (Fig. 13.) Assume an erect position, with the hands on the hips and the heels touching. With the muscles tense, the performer then leaps with a straddling motion, bringing the feet together so that one time the heels and then the toes are turned outward, as shown by the diagrams below, Fig. 13. Follow this by assuming the same positions without lifting the feet. This is done by a slight simultaneous raising of the heels or of the toes and balls of the feet.

Fig. 12. Leg Swinging.

d. THE DEEP KNEE BEND (Fig. 14.) In this motion the bend should be as low as possible, until the seat almost touches the heels. The upper part of the body should not incline to the front, but on the contrary, should be held in a vertical position from beginning to end of the exercise. The small of the back is drawn in, and the heels are raised as high as possible, and must be kept together. There is no exercise which will show improvement on the part of the performer more than this. Those who can lower themselves but a short distance at first will soon find it possible to go down almost, or quite, upon their heels.

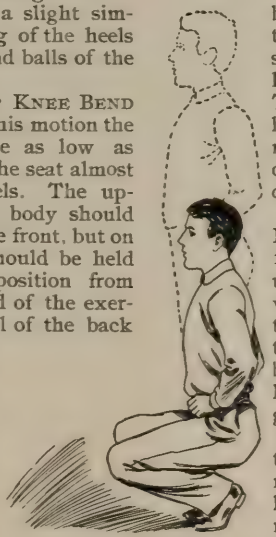


Fig. 14. Deep Knee Bend.

e. KNEE RAISING AND LEG STRETCHING (Fig. 15.) Begin with the heels together, body erect. Raise the knee so high that the thigh is in a horizontal position, being careful that the trunk is always held upright. With the knee hanging vertically downward, the foot bent slightly upward, as in Fig. 15, the whole leg is now quickly and vigorously extended and lowered, the thigh being lowered slightly, as the foot is extended, but not enough to make the full stretching of the leg impossible. The supporting leg, of course, must be held rigid during the exercise.

f. RAISING THE LOWER LEG (Fig. 16.) Assume an upright position, with the thumbs in the waistband and heels together. Alternately the left and right lower legs are raised backward

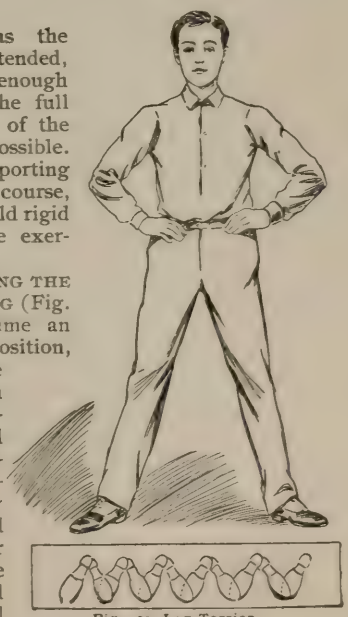


Fig. 13. Leg Torsion.

by bending the knee as in Fig. 16, and lowered again slowly or with a swing. With practice, the leg may be carried so far that the heel will touch the seat. To perform the exercise properly and most effectively great care must be taken that the thigh of the moving leg be held perfectly vertical and close against the supporting leg.

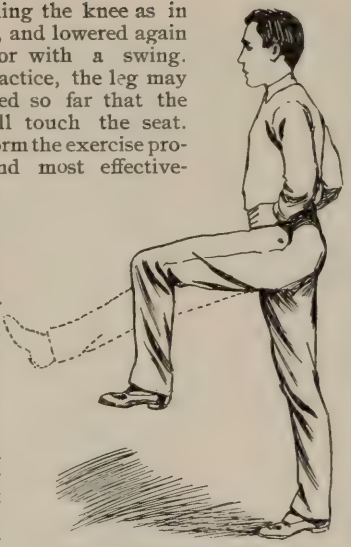


Fig. 15. Knee Raising Forward and Stretching.

g. STANDING ON THE TOES. Starting from an upright position, with the weight resting full on the soles, the foot is bent upward (without bending any joints except those of the ankle and the toes) until the whole weight of the body rests on the toes and balls of the only feet. The heels should be lifted as high as possible; then let the body down slowly, and repeat until a slight fatigue is felt.

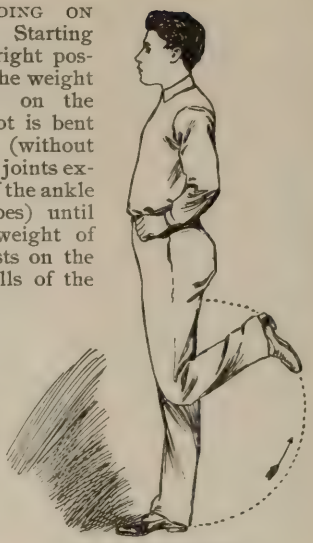
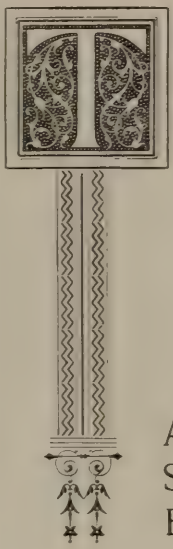


Fig. 16. Raising Lower Leg.

ETHEL BARRYMORE AND HER SWEET-TONED HARP

BOOK VII



THE SONGS WE LOVE TO SING

—EMBRACING—

About a Half Hundred of the Dear Old Songs that Everybody Loves and Other Bright Popular New Pieces

SONGS OF PATRIOTISM
RELIGIOUS FAVORITES
SONGS OF LOVE AND
ROLLICKING JOLLY SONGS

That all may sing around the Family Piano or Fireside. Everybody knows them, Everybody loves them; and to those who have forgotten the words or music this book will refresh the memory

Columbia, the Gem of the Ocean, America, The Star-Spangled Banner, Yankee Doodle, Dixie, The Old Oaken Bucket, The Last Rose of Summer, Robin Adair, Annie Laurie, Nancy Lee, Rocked in the Cradle of the Deep, Listen to the Mocking Bird, Old Folks at Home, and dozens of others as familiar and almost as popular. Both words and music are found in this volume.

THE SONGS WE LOVE TO SING

Prepared Originally and Expressly for this Volume

BY GEORGE M. VICKERS

Author of "Guard the Flag" etc.

THE LITTLE FORESTERS.

A Musical Sketch for Arbor Day.

Preparation: A platform, with walls at sides and rear decorated with evergreen; several palms and rubber plants ranged along sides of platform. Benches or stools right and left of platform, leaving plenty of room in the centre for evolutions of the children.

CHARACTERS.

Colonel Acorn,
Major Hickory
Captain Juniper, } Foresters.
Lieutenant Spruce,
Sergeant Peach,

Lily Hawthorn,
Daisy Primrose,
Violet Cornflower, } School Girls.
Pansy Pink,
Lady Slipper,

Also, ten boys and ten girls for chorus and evolutions.

COSTUMES.

Foresters: Brown muslin blouses, with orange colored sashes worn over right shoulder, and tied in a bow at left hip. Each boy wears an evergreen wreath, and carries a staff with red white and blue ribbon tied near the top.

School Girls: Pink lawn dresses with green sashes wreaths of flowers to be worn on the head. Each girl to carry a bunch of flowers.

Ten Boys: Dark pants, white shirt-waists.

Ten Girls: White dresses, pink sashes Each boy and girl to wear a red, white and blue rosette on left breast, and also to carry a small bunch of evergreen.

Directions: The ten boys and ten girls enter upon the platform, singing the following words; the girls enter from the right, the boys from the left; they countermarch, and take up positions along the sides, the boys at right, the girls at left of platform.

SONG OF THE TREES.

Tune: "Comin' Thr'o the Rye."

1.

HAIL the day with cheers of gladness,
Let your voices ring;
Of the trees, their use and beauty,
Merrily we sing:
By the roadside, in the orchard,
Or the forest grand,
All the trees, wher'er we find them,
Grow to bless the land.

2.

Trees that shade the dusty wayside,
These should have our care,
For they shield the weary trav'ler
From the sun's bright glare;
'Neath their green and cooling branches,
Ling'ring while we may,
Oh, how restful, how refreshing
In the heat of day!

3.

Apple blossoms, cherry blossoms,
Fair are they to see,
Full of promise of the fruitage
Soon to deck the tree.
Golden quince, and rosy apple,
Ripe and luscious pear,
Are among the orchard's treasures
That we all may share

4.

Sturdy oak and stately poplar,
Cedar, elm and pine,
I would spare you, I would shield you,
If the power were mine.
Hail the day with cheers of gladness,
Let your voices ring;
Plant your trees that they for others
Blessings sweet may bring.

DIRECTIONS. The boys and girls should take positions at the right and left of platform while singing the last stanza.

Immediately after the singing ceases The Five Foresters enter and advance to front of platform.

Colonel Acorn. Ladies and gentlemen, we have been attracted by your merry voices—may we join in your festivities?

Boys and Girls. Welcome! We too are tree-planters, and foresters are our friends.

Foresters. Thanks, many thanks.

Colonel Acorn.

"Who sows a field, or trains a flower,
Or plants a tree, is more than all.
For he who blesses most is blest;
And God and man shall own his worth,
Who toils to leave, as his bequest,
An added beauty to the earth."

Major Hickory. The man or woman who plants a tree is a public benefactor, and the tree will need no epitaph upon it to proclaim the virtue of the one who planted it. It will be a beautiful monument to a generous soul.

Captain Juniper.

I'm Captain Juniper,
Friends, as you see,
Named for a popular
Sort of a tree;
Though valued by many,
Some think it a sin,
That juniper berries
Get mixed up with gin.

Boys and Girls. It is not the tree, nor its berries; it is not the golden grain; it is simply the use, or abuse of berry and grain that makes them good or evil.

Lieutenant Spruce. Ladies and gentlemen, I am Lieutenant Spruce, and, while I admit that I spruce up once in a while, it must not be inferred that I am a dude. The spruce tree is very useful, it is a pretty ornament in a landscape; besides, you've all tasted spruce beer.

Sergeant Peach. (Bowing low) I'm a Peach, ladies and gentlemen, a descendant of the old and honorable Peach family—Like the tree and its luscious fruit—which bear our ancient name, everybody likes the Peaches.

Captain Acorn. Hark! I hear approaching footsteps.

School girls enter, singing the following:

JOY FOR THE STURDY TREES.

(*Tune: "My Country 'tis of Thee."*

1.

"Joy for the sturdy trees!
Fanned by each fragrant breeze,
Lovely they stand!
The song-birds o'er them thrill,
They shade each tinkling rill,
They crown each swelling hill,
Lowly or grand.

Directions: At the beginning of the second stanza the Foresters march, followed by the school girls, the ten boys and ten girls following—All sing and countermarch.

2.

"Plant them by stream and way,
Plant where the children play
And toilers rest;
In every verdant vale,
On every sunny swale,
Whether to grow or fail—
God knoweth best.

3.

"Select the strong, the fair,
Plant them with earnest care—
No toil is vain.
Plant in a fitter place,
Where, like a lovely face,
Set in some sweeter grace,
Change may prove gain.

4.

"God will His blessing send—
All things on Him depend.
His loving care
Clings to each leaf and flower
Like ivy to its tower.
His presence and His power
Are everywhere."

While singing the last stanza, all resume their original positions. The Foresters and school girls to occupy the front centre of platform.

Captain Acorn. Much has been said of the trees, and very justly; but from the flowers I see, I think they, too, deserve our praise, even if some of them are old fashioned.

Lady Slipper. Indeed I love old fashioned flowers, and these are my friends, Miss Hawthorn, Miss Primrose, Miss Pink, and Miss Cornflower. I'm sure they are all sweet and charming.

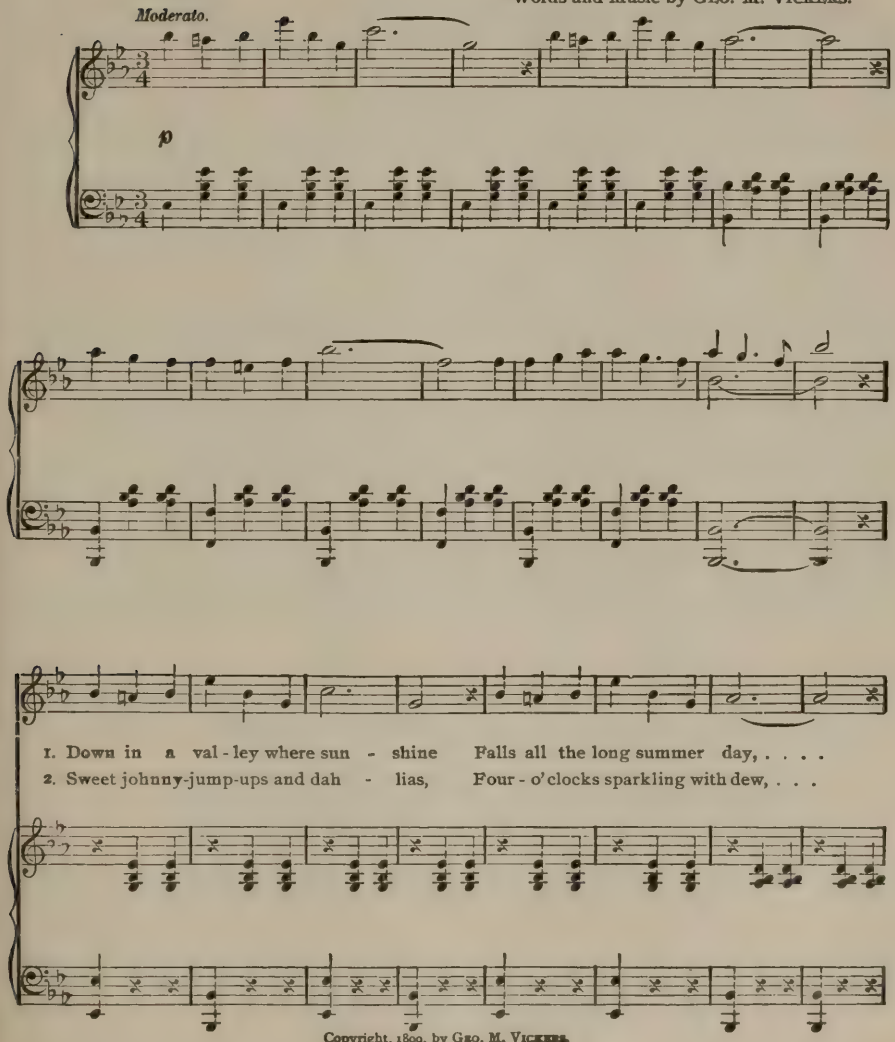
Lily H. You love them, so suppose you sing us something about them.

School girls, Oh, please do!

Lady Slipper sings the following song; all the children joining in the chorus.

OLD-FASHIONED FLOWERS.

Words and Music by GEO. M. VICKERS.


Moderato.
p
1. Down in a val - ley where sun - shine Falls all the long summer day, ...
2. Sweet johnny-jump-ups and dah - lias, Four - o'clocks sparkling with dew, . . .

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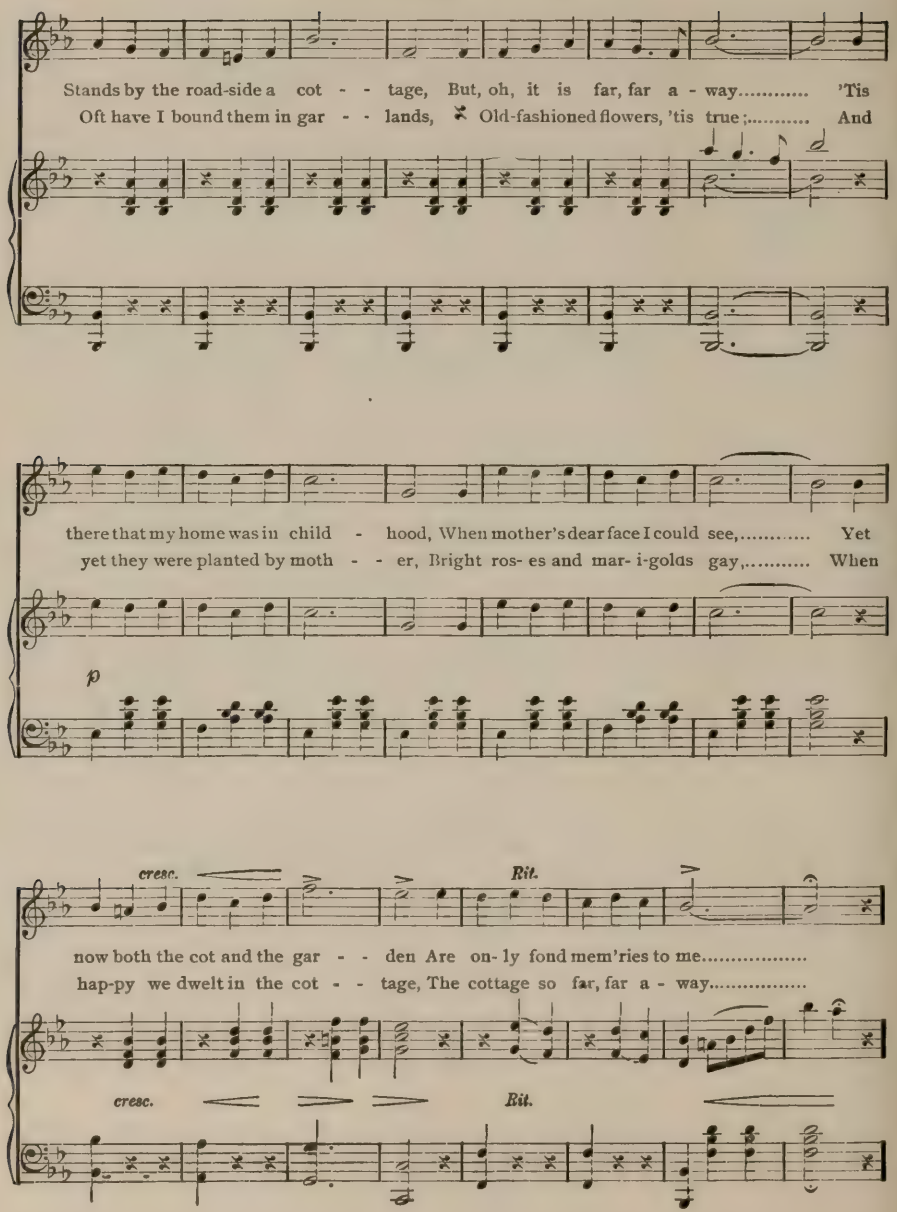
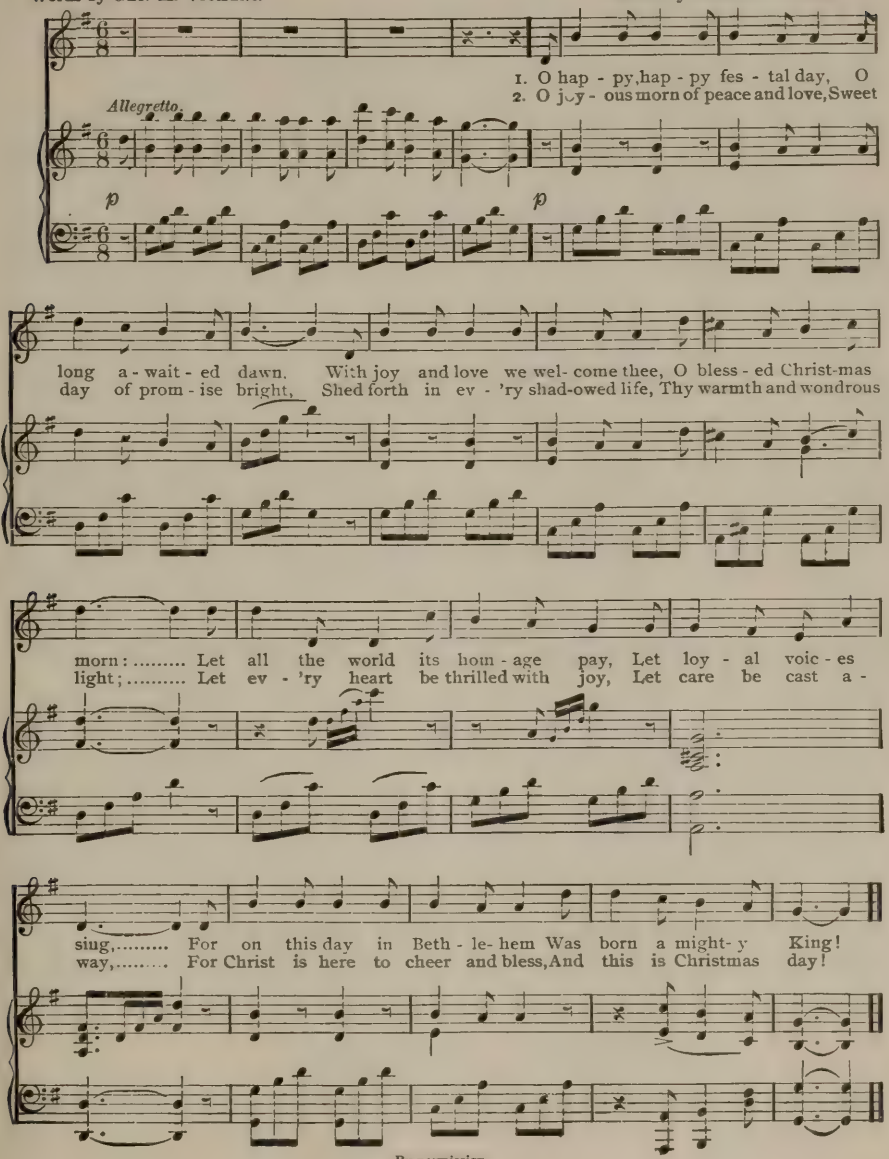

Stands by the road-side a cot - - tage, But, oh, it is far, far a - way..... 'Tis
Oft have I bound them in gar - - lands, Old-fashioned flowers, 'tis true;..... And
there that my home was in child - hood, When mother's dear face I could see,..... Yet
yet they were planted by moth - - er, Bright ros- es and mar- i-golds gay,..... When
p
cresc.
Rit.
now both the cot and the gar - - den Are on- ly fond mem'ries to me.....
hap-py we dwelt in the cot - - tage, The cottage so far, far a - way.....
cresc.
Rit.

A CHRISTMAS SONG.

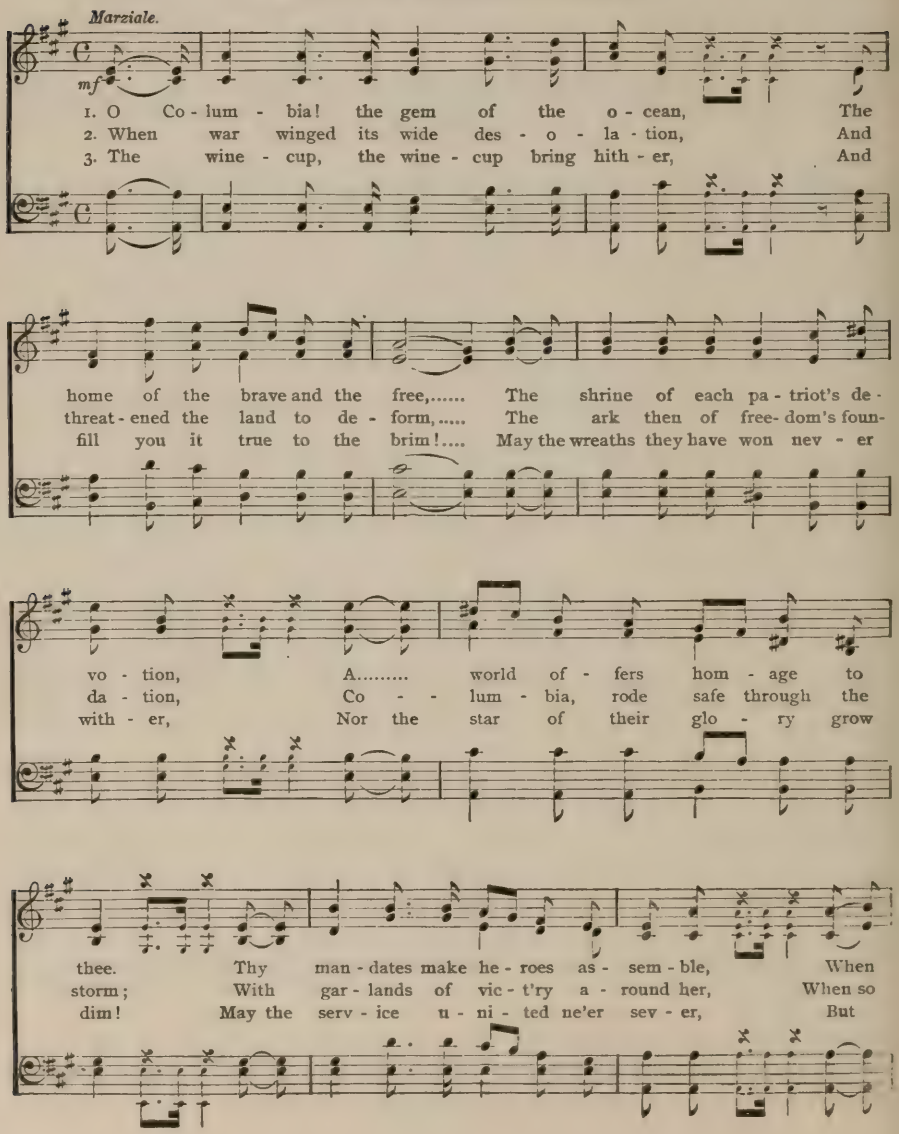
Words by GEO. M. VICKERS. Music by STANLEY ADAMS.


1. O hap - py, hap - py fes - tal day, O
2. O joy - ous morn of peace and love, Sweet
Allegretto.
p
p
long a - wait - ed dawn. With joy and love we wel- come thee, O bless - ed Christ-mas
day of prom - ise bright, Shed forth in ev - 'ry shad-owed life, Thy warmth and wondrous
morn: ..... Let all the world its hom - age pay, Let loy - al voic - es
light; ..... Let ev - 'ry heart be thrilled with joy, Let care be cast a -
sing, ... For on this day in Beth - le- hem Was born a might- y King!
way, ... For Christ is here to cheer and bless, And this is Christmas day!

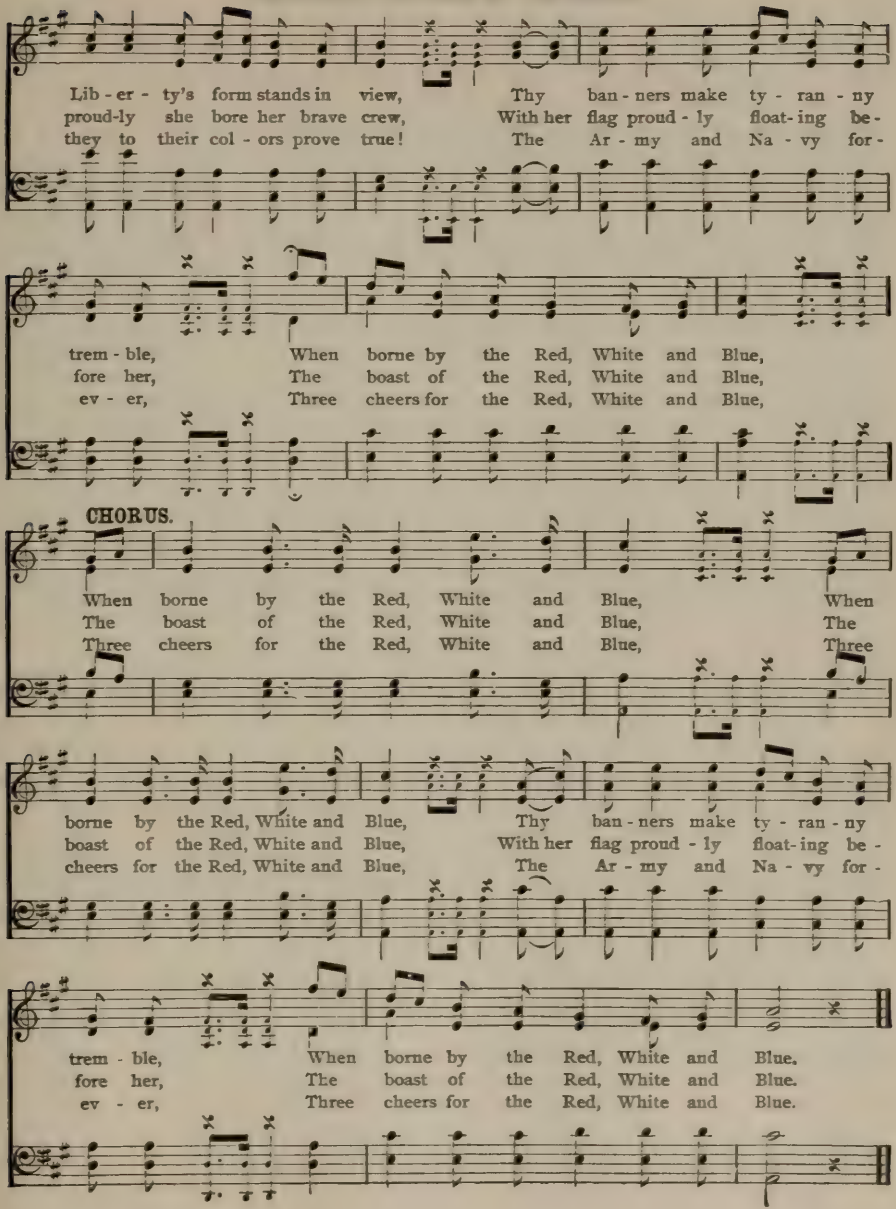
By permission.

COLUMBIA! THE GEM OF THE OCEAN.

May be sung as Solo or Quartet.


Marziale.
mf
1. O Co - lum - bia! the gem of the o - cean, The
2. When war winged its wide des - o - la - tion, And
3. The wine - cup, the wine - cup bring hith - er, And
home of the brave and the free,..... The shrine of each pa - triot's de -
threat - ened the land to de - form,..... The ark then of free - dom's foun -
fill you it true to the brim!.... May the wreaths they have won nev - er
vo - tion, A..... world of - fers hom - age to
da - tion, Co - - lum - bia, rode safe through the
with - er, Nor the star of their glo - ry grow
thee. Thy man - dates make he - roes as - sem - ble, When
storm; With gar - lands of vic - t'ry a - round her, When so
dim! May the serv - ice u - ni - ted ne'er sev - er, But

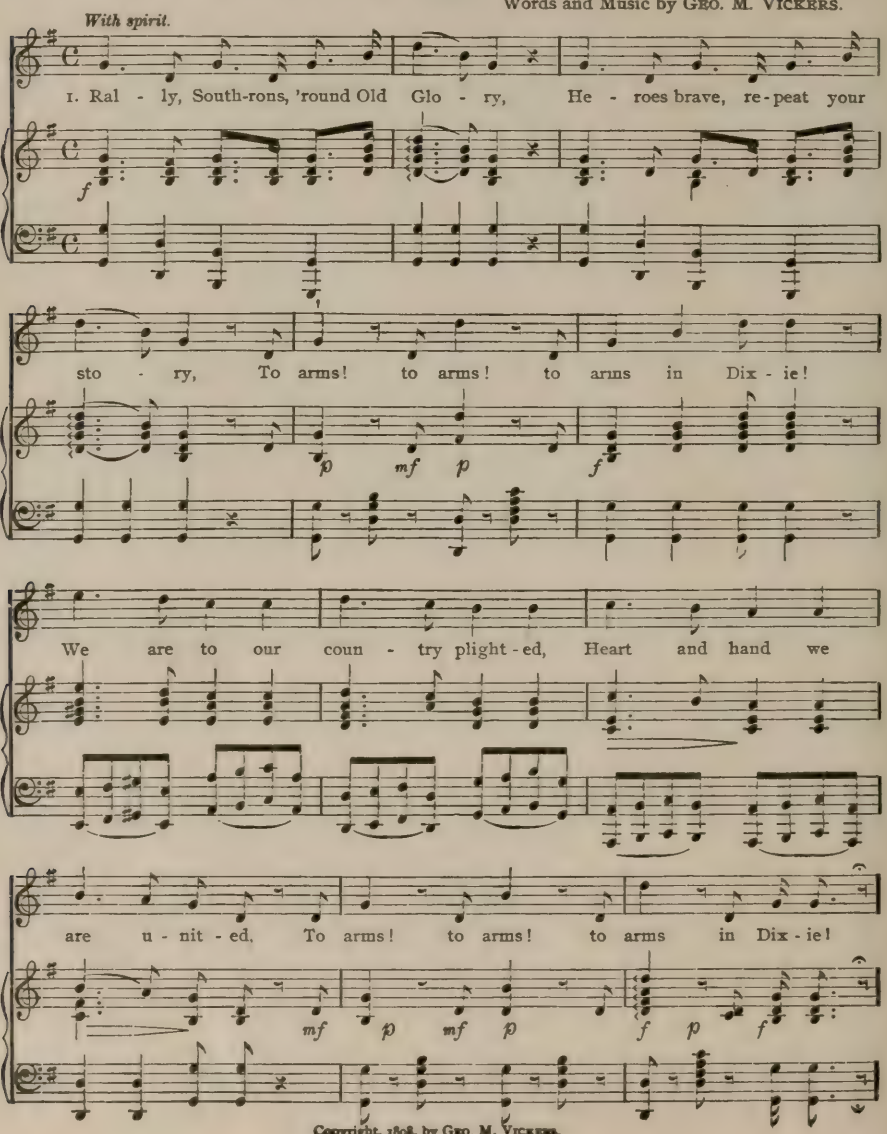
COLUMBIA! THE GEM OF THE OCEAN.


Lib - er - ty's form stands in view, Thy ban - ners make ty - ran - ny
proud-ly she bore her brave crew, With her flag proud - ly float - ing be -
they to their col - ors prove true! The Ar - my and Na - vy for -
trem - ble, When borne by the Red, White and Blue,
fore her, The boast of the Red, White and Blue,
ev - er, Three cheers for the Red, White and Blue,
CHORUS.
When borne by the Red, White and Blue, When
The boast of the Red, White and Blue, The
Three cheers for the Red, White and Blue, Three
borne by the Red, White and Blue, Thy ban - ners make ty - ran - ny
boast of the Red, White and Blue, With her flag proud - ly float - ing be -
cheers for the Red, White and Blue, The Ar - my and Na - vy for -
trem - ble, When borne by the Red, White and Blue.
fore her, The boast of the Red, White and Blue.
ev - er, Three cheers for the Red, White and Blue.

THE NEW DIXIE.

NOTE.—The words of this song can be sung to the old tune, "DIXIE'S LAND;" they fit exactly. Use the old tune, Key of C, the last time the Chorus is sung; the effect is thrilling.

Words and Music by GEO. M. VICKERS.


With spirit.
1. Ral - ly, South-rons, 'round Old Glo - ry, He - roes brave, re-peat your
sto - ry, To arms! to arms! to arms in Dix - ie!
We are to our coun - try plight-ed, Heart and hand we
are u - nit - ed, To arms! to arms! to arms in Dix - ie!

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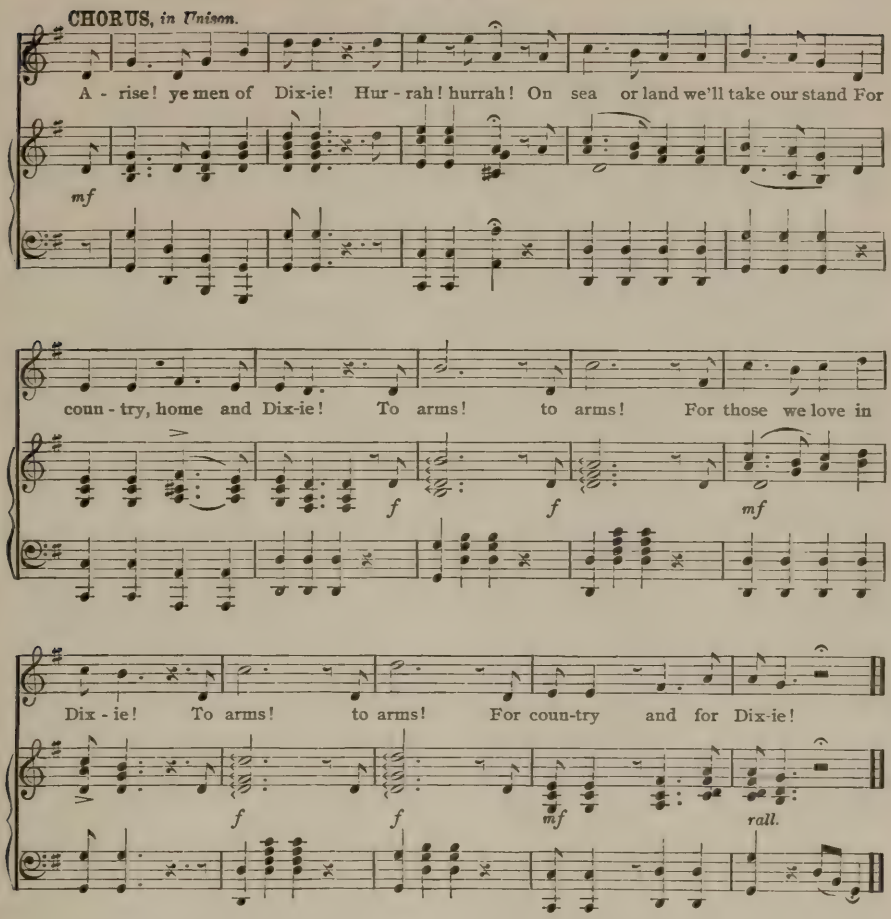

CHORUS, in Unison.
A - rise! ye men of Dix-ie! Hur - rah! hurrah! On sea or land we'll take our stand For
mf
coun - try, home and Dix-ie! To arms! to arms! For those we love in
f
f
mf
Dix - ie! To arms! to arms! For coun-try and for Dix-ie!
f
f
mf
rall.

2 Sons of heroes, shout defiance,
On just Heaven place reliance,
To arms! to arms! to arms in Dixie!
Southron arms will shield the nation,
Save our flag from degradation,
To arms! to arms! to arms in Dixie!

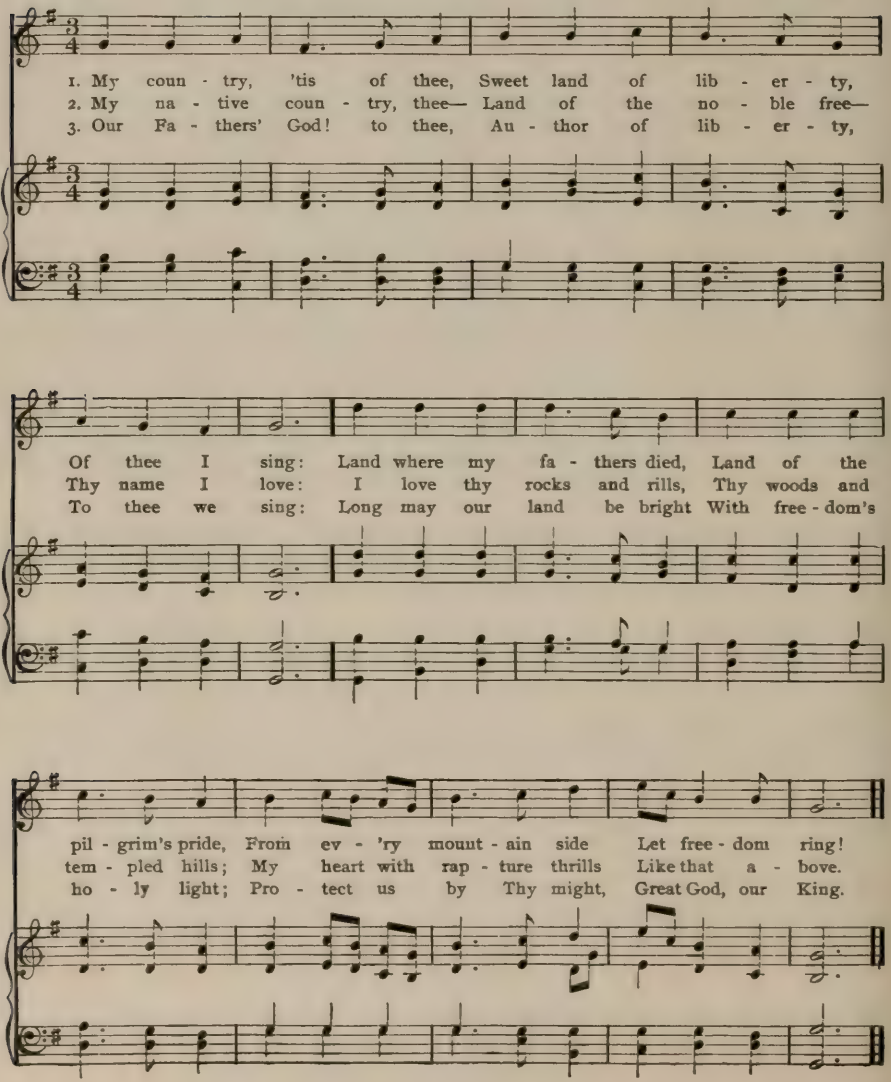
3 Up and march to meet the foemen,
Let your war-cry be their omen,
To arms! to arms! to arms in Dixie!
'Neath the flag, a band of brothers,
For your sweethearts, wives and mothers,
To arms! to arms! to arms in Dixie!

4 Rally, men, from every station,
Show the valor of your nation,
To arms! to arms! to arms in Dixie!
Keep ablaze your beacon fires,
Strike for honor of your sires!
To arms! to arms! to arms in Dixie!

AMERICA.—"My Country, 'tis of Thee."

May be sung as Solo or Chorus.

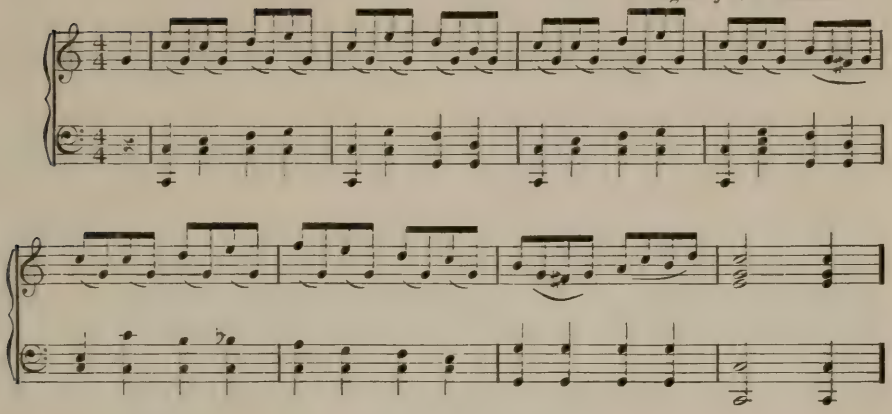
S. F. SMITH. HANDEL.


1. My coun - try, 'tis of thee, Sweet land of lib - er - ty,
2. My na - tive coun - try, thee— Land of the no - ble free—
3. Our Fa - thers' God! to thee, Au - thor of lib - er - ty,
Of thee I sing: Land where my fa - thers died, Land of the
Thy name I love: I love thy rocks and rills, Thy woods and
To thee we sing: Long may our land be bright With free - dom's
pil - grim's pride, From ev - 'ry mount - ain side Let free - dom ring!
tem - pled hills; My heart with rap - ture thrills Like that a - bove.
ho - ly light; Pro - tect us by Thy might, Great God, our King.

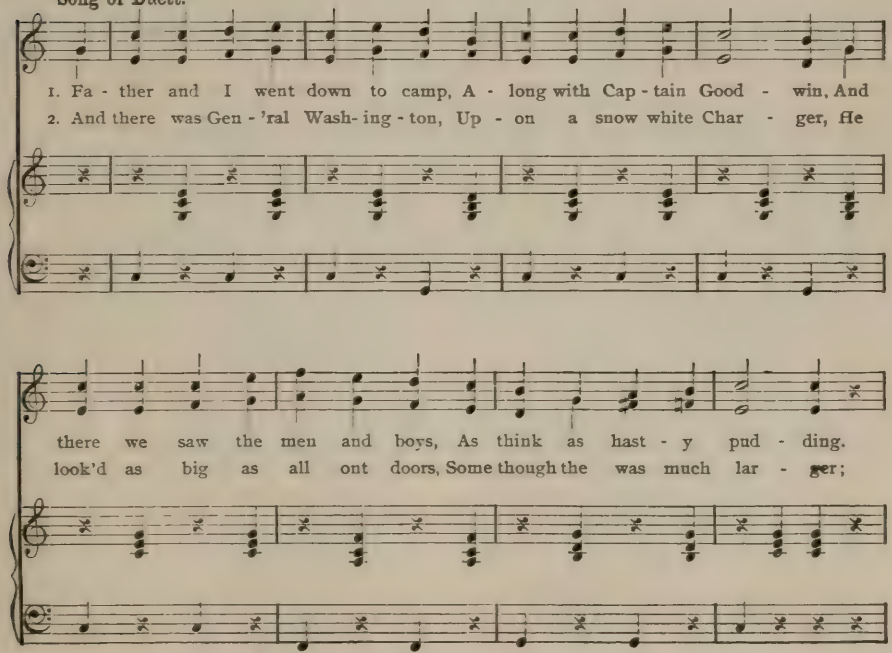
YANKEE DOODLE.

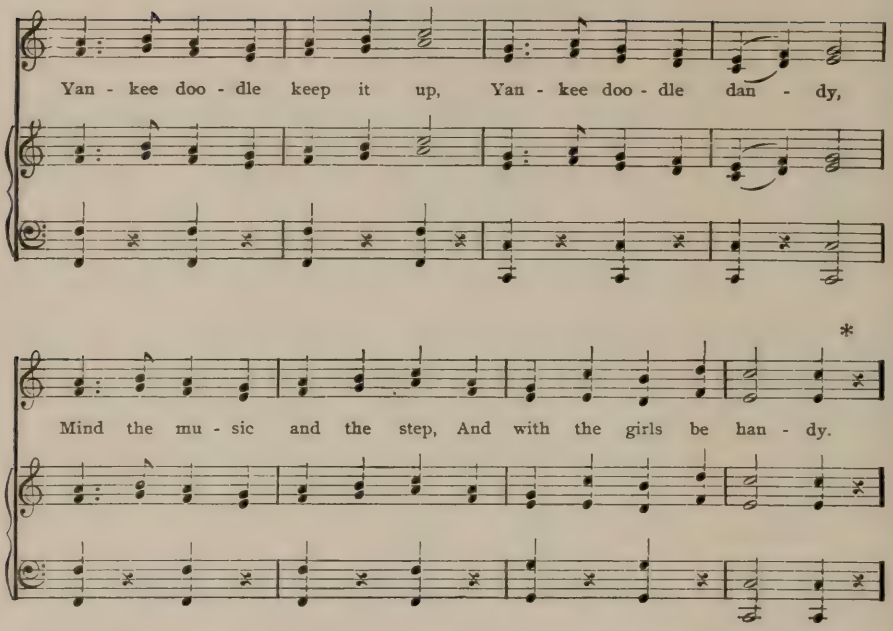
Song Duett and Chorus.

Arranged by S. T. GORDON.



Song or Duett.


1. Fa - ther and I went down to camp, A - long with Cap - tain Good - win, And
2. And there was Gen - 'ral Wash- ing - ton, Up - on a snow white Char - ger, He
there we saw the men and boys, As think as hast - y pud - ding.
look'd as big as all ont doors, Some though the was much lar - ger;



3.
And there was Col'nel Putnam too,
Drest in his regimentals,
I guess as how the Brittish King,
Can't whip our Continentals.

4.
And there they had a copper gun,
Big as a log of maple,
They tied it to a wooden cart,
A load for Father's cattle.

5.
And ev'ry time they fir'd it off,
It took a horn of powder,
It made a noise like Father's gun,
Only a nation louder.

6.
I went as near to it myself,
As any body dare go.
And Father went as near again,
I thought he dar'nt do so.

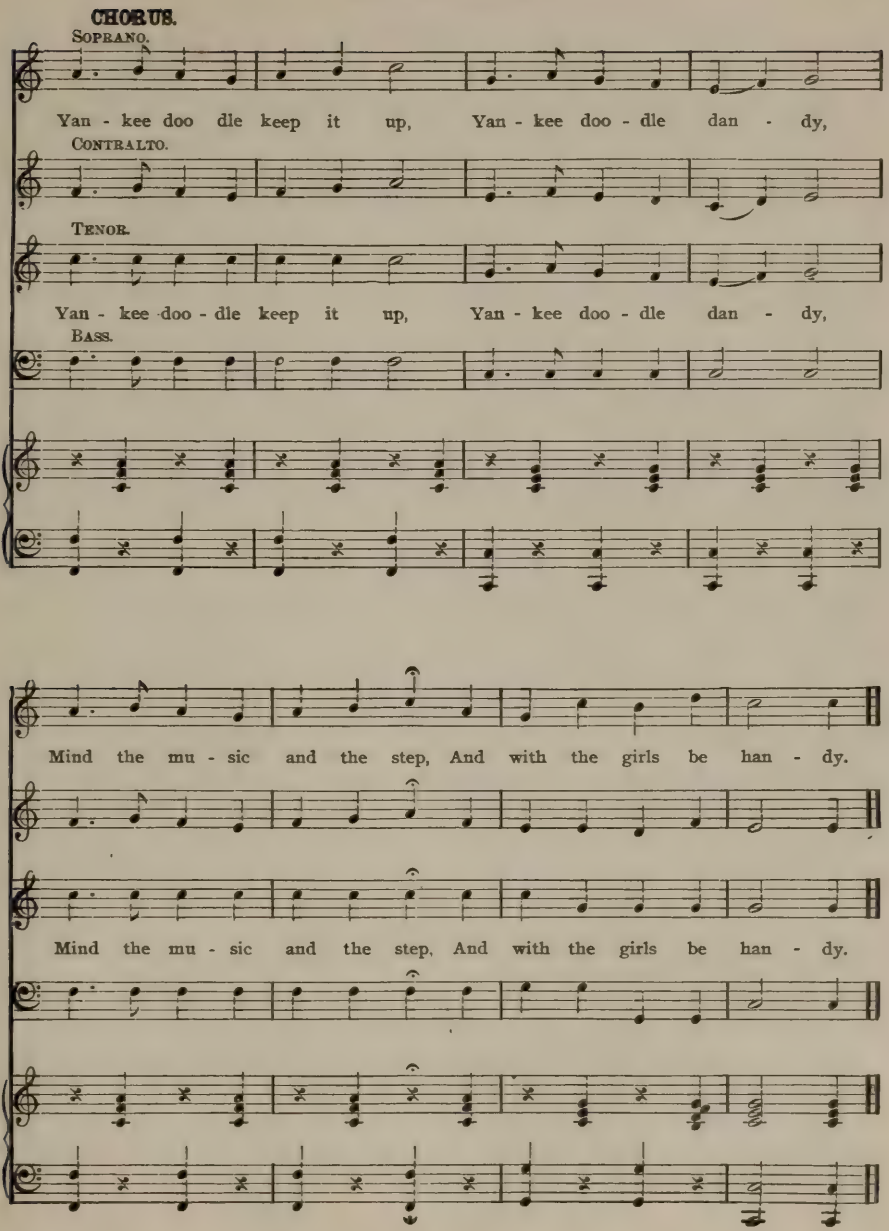
7.
And there I see'd a little keg,
All bound around with leather,
They beat it with two little sticks,
To call the men together.

8.
And there they fif'd away like fun,
And play'd on cornstalk fiddles,
And some had ribbins round their hats,
And some around their middles.

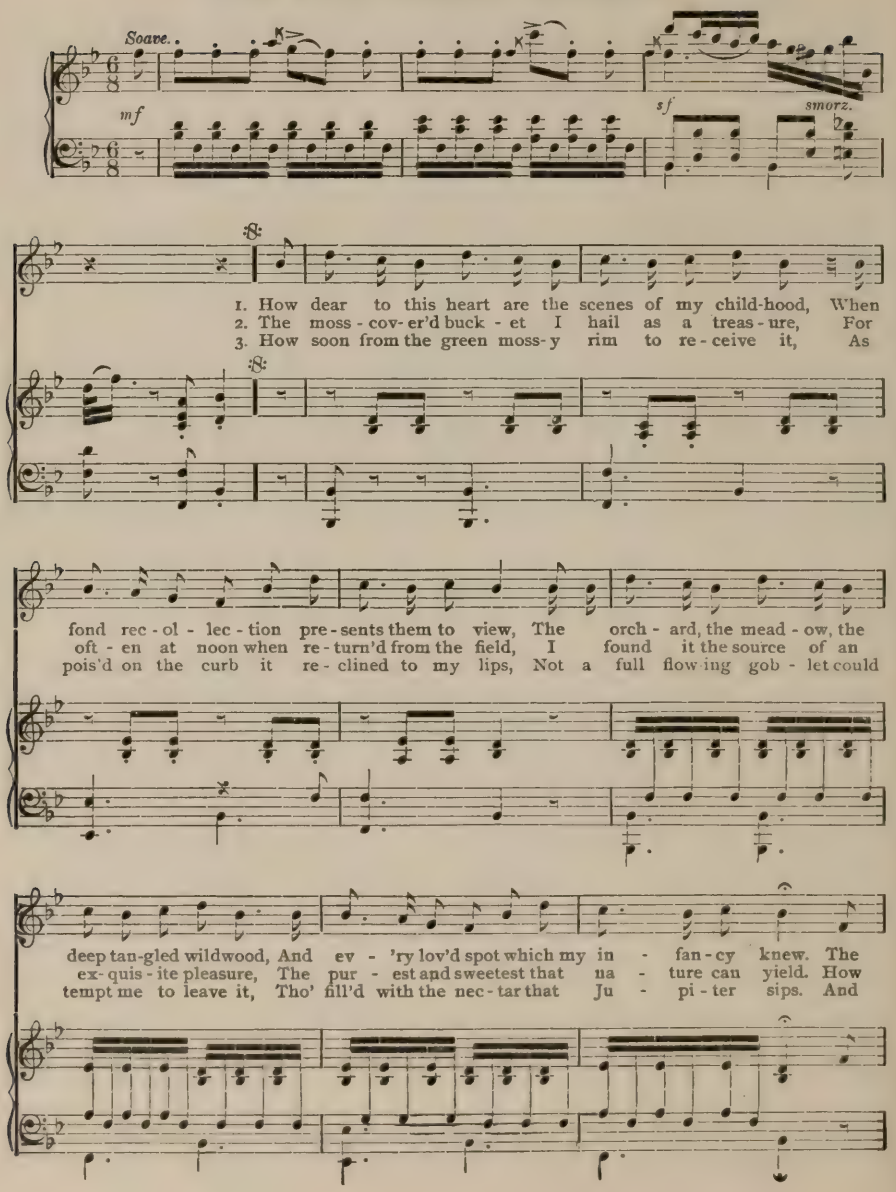
9.
The troopers too, would gallop up,
And fir'd in all direction,
I thought they really meant to kill
All the cow boys in the nation.

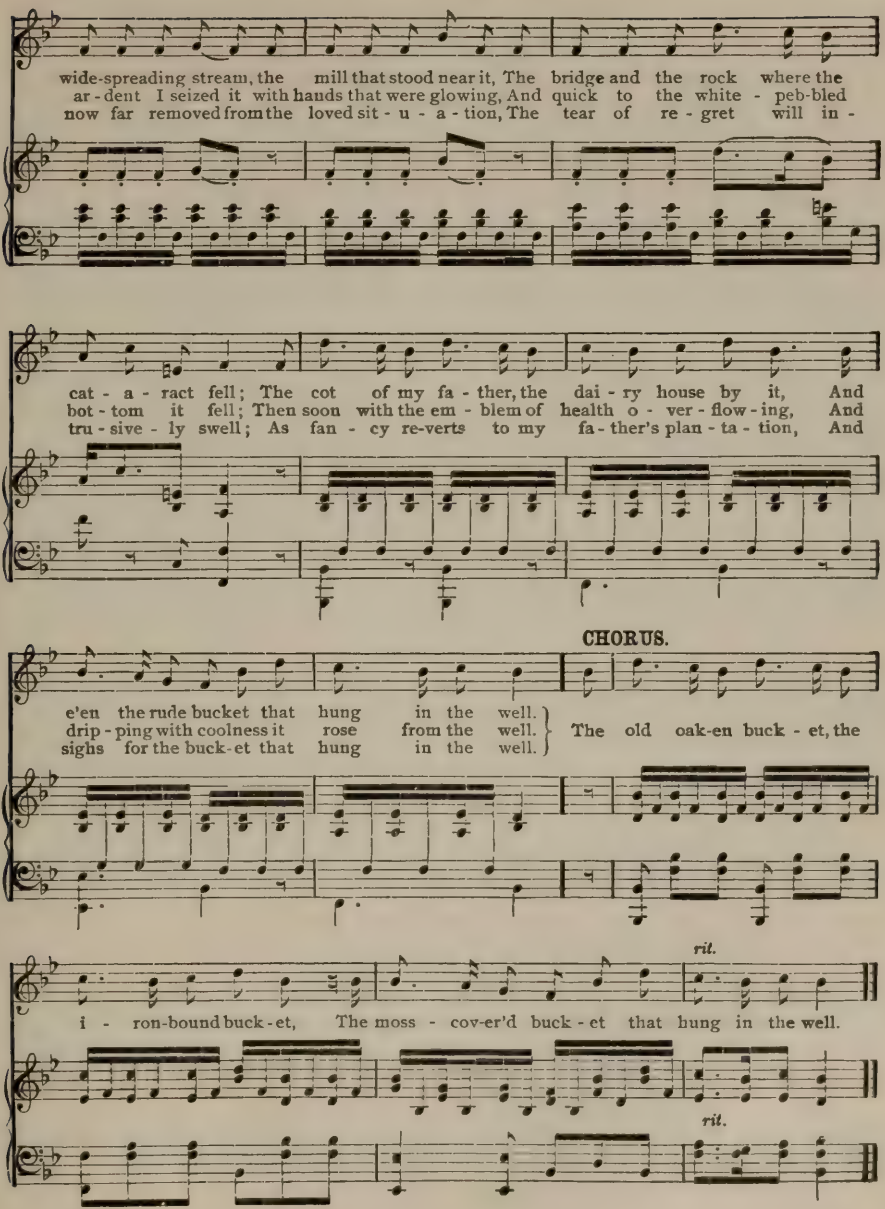
10.
But I can't tell you half I see'd,
They kept up such a smother,
I took my hat off, made a bow,
And scamper'd home to Mother.

*(*For Chorus, see page 472.*)


CHORUS.
SOPRANO.
Yan - kee doo dle keep it up, Yan - kee doo - dle dan - dy,
CONTRALTO.
TENOR.
Yan - kee doo - dle keep it up, Yan - kee doo - dle dan - dy,
BASS.
Mind the mu - sic and the step, And with the girls be han - dy.
Mind the mu - sic and the step, And with the girls be han - dy.

THE OLD OAKEN BUCKET.

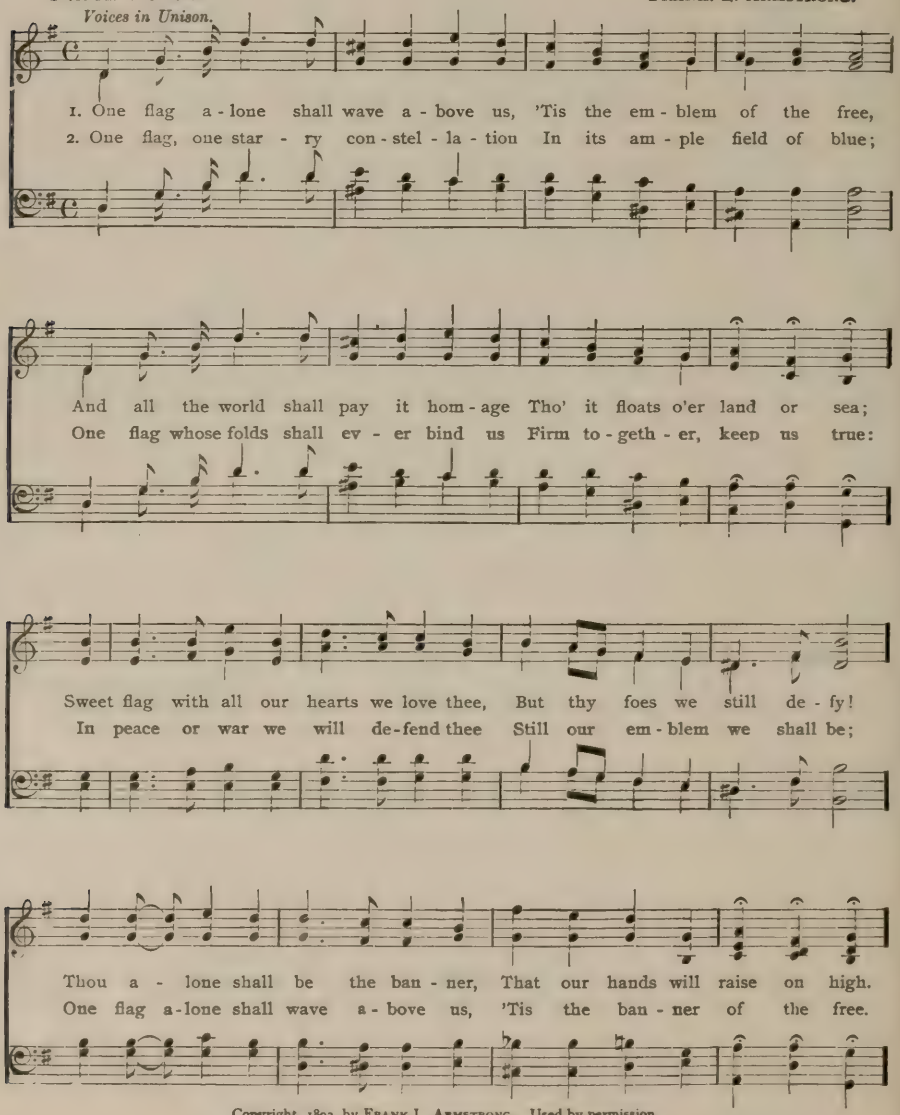

Soave.
mf
sf
smorz.
1. How dear to this heart are the scenes of my child-hood, When
2. The moss - cov- er'd buck - et I hail as a treas - ure, For
3. How soon from the green moss - y rim to re - ceive it, As
fond rec - ol - lec - tion pre - sents them to view, The orch - ard, the mead - ow, the
oft - en at noon when re - turn'd from the field, I found it the source of an
pois'd on the curb it re - clined to my lips, Not a full flow ing gob - let could
deep tan-gled wildwood, And ev - 'ry lov'd spot which my in - fan - cy knew. The
ex- quis - ite pleasure, The pur - est and sweetest that na - ture can yield. How
tempt me to leave it, Tho' fill'd with the nec - tar that Ju - pi - ter sips. And


wide-spreading stream, the mill that stood near it, The bridge and the rock where the
ar-dent I seized it with hands that were glowing, And quick to the white-peb-bled
now far removed from the loved sit-u-a-tion, The tear of re-gret will in-
cat-a-ract fell; The cot of my fa-ther, the dai-ry house by it, And
bot-tom it fell; Then soon with the em-blem of health o-ver-flow-ing, And
tru-sive-ly swell; As fan-cy re-verts to my fa-ther's plan-ta-tion, And
CHORUS.
e'en the rude bucket that hung in the well.
drip-ping with coolness it rose from the well.
sighs for the buck-et that hung in the well.
The old oak-en buck-et, the
rit.
i-ron-bound buck-et, The moss-cov-er'd buck-et that hung in the well.
rit.

THE STARS AND STRIPES FOREVER.

GEO. M. VICKERS. FRANK. L. ARMSTRONG.

Voices in Unison.


1. One flag a-lone shall wave a-bove us, 'Tis the em-blem of the free,
2. One flag, one star-ry con-stel-la-tion In its am-ple field of blue;
And all the world shall pay it hom-age Tho' it floats o'er land or sea;
One flag whose folds shall ev-er bind us Firm to-geth-er, keep us true:
Sweet flag with all our hearts we love thee, But thy foes we still de-fy!
In peace or war we will de-fend thee Still our em-blem we shall be;
Thou a-lone shall be the ban-ner, That our hands will raise on high.
One flag a-lone shall wave a-bove us, 'Tis the ban-ner of the free.

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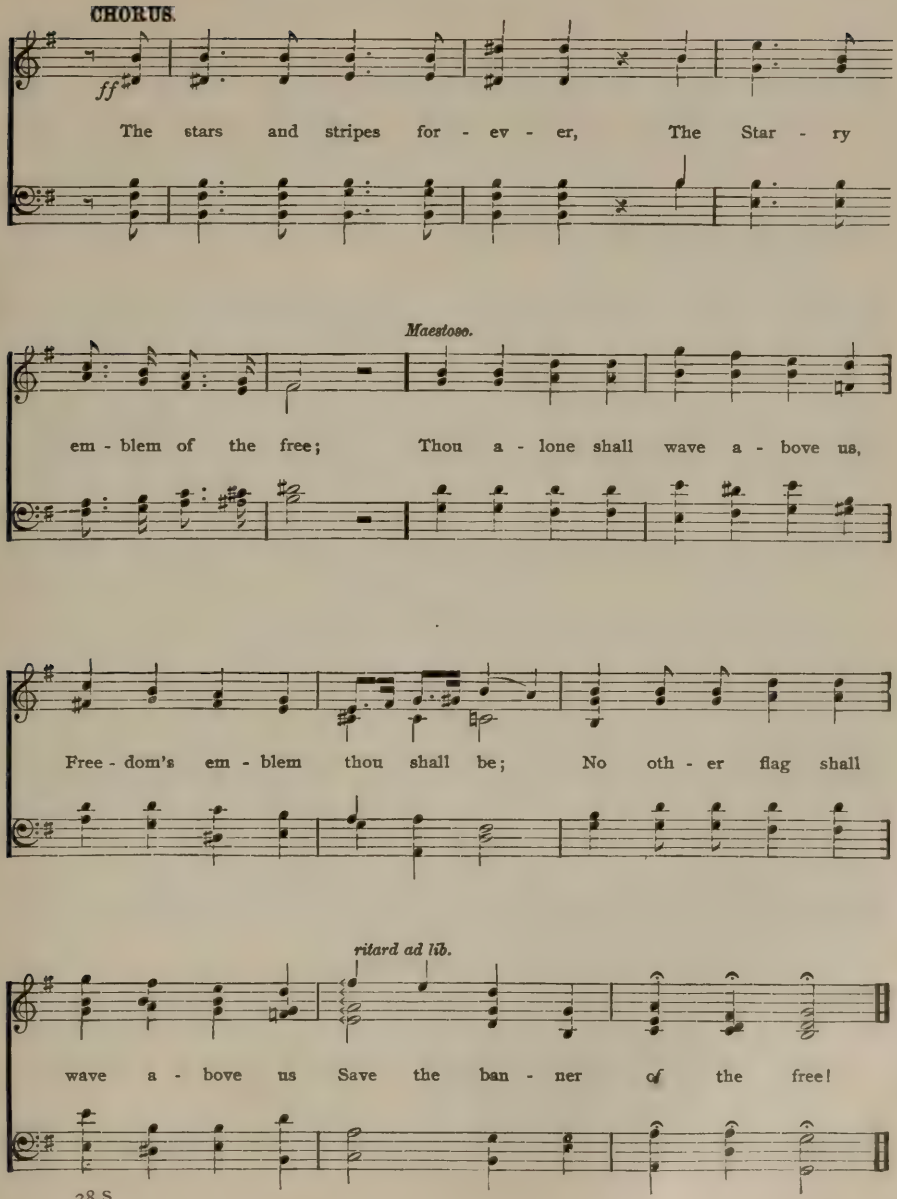
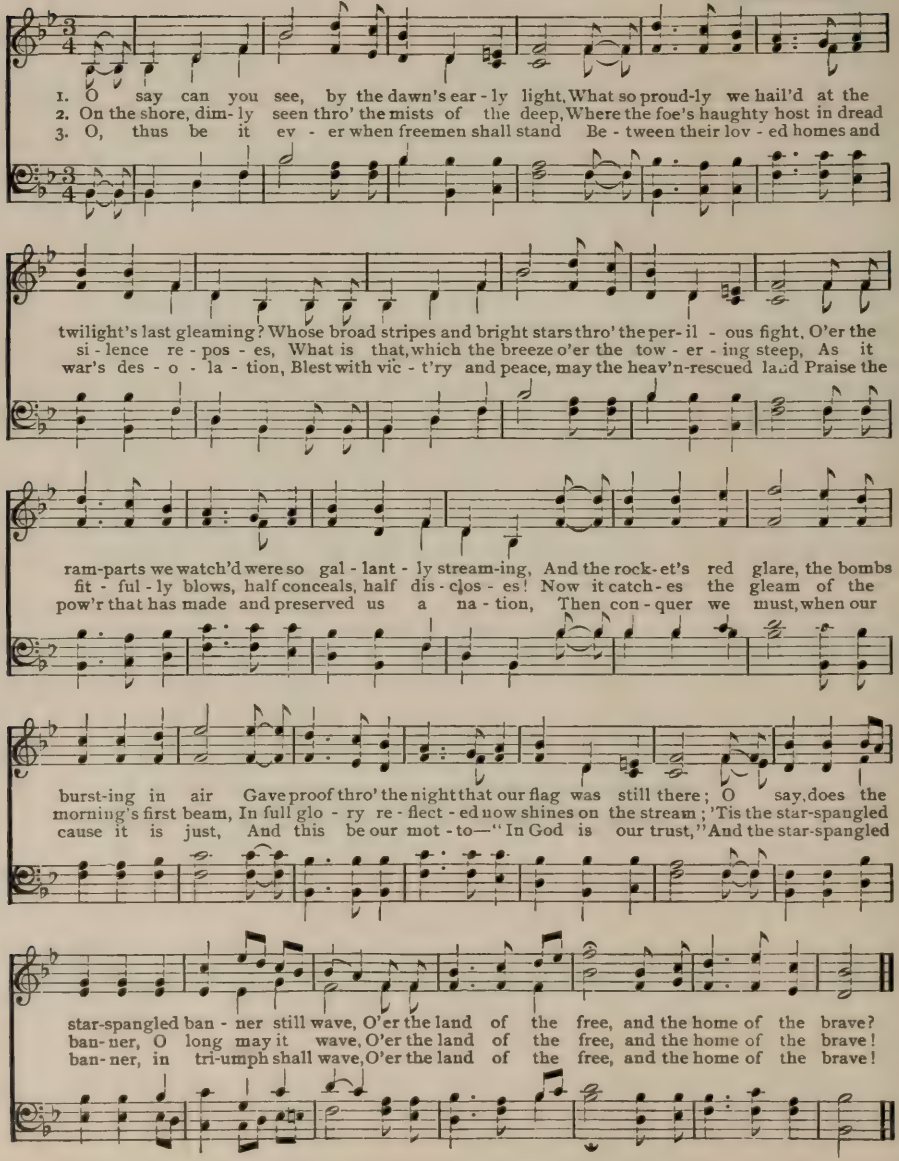

CHORUS.
ff
The stars and stripes for - ev - er, The Star - ry
Maestoso.
em - blem of the free; Thou a - lone shall wave a - bove us,
Free - dom's em - blem thou shall be; No oth - er flag shall
ritard ad lib.
wave a - bove us Save the ban - ner of the free!

STAR SPANGLED BANNER.

FRANCIS KEY.


1. O say can you see, by the dawn's ear - ly light, What so proud-ly we hail'd at the
2. On the shore, dim- ly seen thro' the mists of the deep, Where the foe's haughty host in dread
3. O, thus be it ev - er when freemen shall stand Be - tween their lov - ed homes and
twilight's last gleaming? Whose broad stripes and bright stars thro' the per- il - ous fight, O'er the
si - lence re - pos - es, What is that, which the breeze o'er the tow - er - ing steep, As it
war's des - o - la - tion, Blest with vic - t'ry and peace, may the heav'n-rescued land Praise the
ram-parts we watch'd were so gal - lant - ly stream-ing, And the rock- et's red glare, the bombs
fit - ful - ly blows, half conceals, half dis - clos - es! Now it catch- es the gleam of the
pow'r that has made and preserved us a na - tion, Then con - quer we must, when our
burst-ing in air Gave proof thro' the night that our flag was still there; O say, does the
morning's first beam, In full glo - ry re - flect - ed now shines on the stream; 'Tis the star-spangled
cause it is just, And this be our mot - to—"In God is our trust," And the star-spangled
star-spangled ban - ner still wave, O'er the land of the free, and the home of the brave?
ban- ner, O long may it wave, O'er the land of the free, and the home of the brave!
ban- ner, in tri-umph shall wave, O'er the land of the free, and the home of the brave!

COLUMBIA, MY COUNTRY.

(Copy.)

Philadelphia, March 20th, 1893.

To whom it may concern:—

In consideration of the blessings of American Liberty, which I have always enjoyed, and for the purpose of encouraging a love of Country in the hearts of the young. I hereby transfer the Copyright of the anthem "Columbia, My Country" to the United States of America, so that it may be published and used by any person free of royalty or claim. GEO. M. VICKERS.

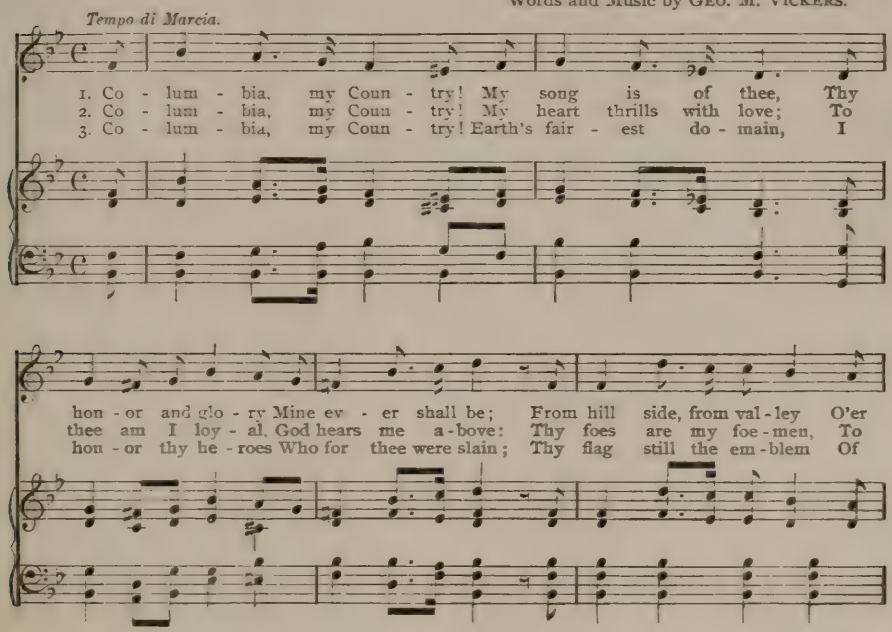
Witnesses—
W. WES. CHEW.
JOSEPH W. MORTON, Jr.

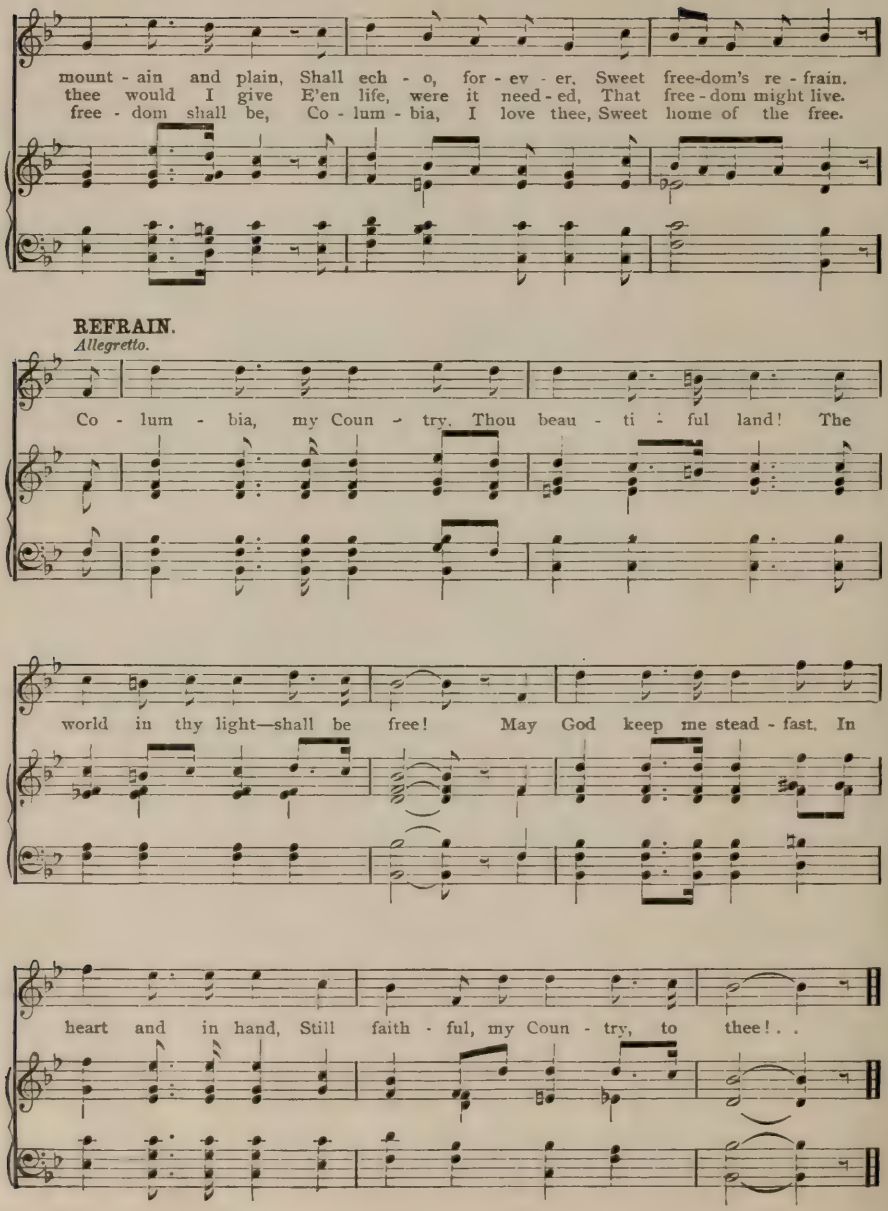
The within assignment of copyright is this day recorded in the Office of the Librarian of Congress, in conformity with the Laws of the United States respecting copyrights. Witness my hand and the seal of my office, this 23 day of March, 1893. A. R. SPOFFORD, Librarian of Congress.

WORDS OF ENDORSEMENT AND APPRECIATION.

"The sentiment of the song will, I am sure, be indorsed by every true American," WILLIAM MCKINLEY; "Full of patriotic sentiment, well expressed," GOVERNOR WILLIAM E. RUSSELL, Massachusetts; "It is patriotic in sentiment and the music is charming," GOVERNOR J. M. STONE, Mississippi; "It is a patriotic gem, and will probably remain one of the patriotic songs of our country," GOVERNOR ELISHA P. FERRY, Washington; "I trust it may be welcomed by an appreciative public with the favor it deserves," GOVERNOR LYMAN E. KNAP, Alaska; "I regard such music as an important part of the education of the young people of the land," HON. JOHN WANAMAKER; and representative Americans in all parts of the United States.

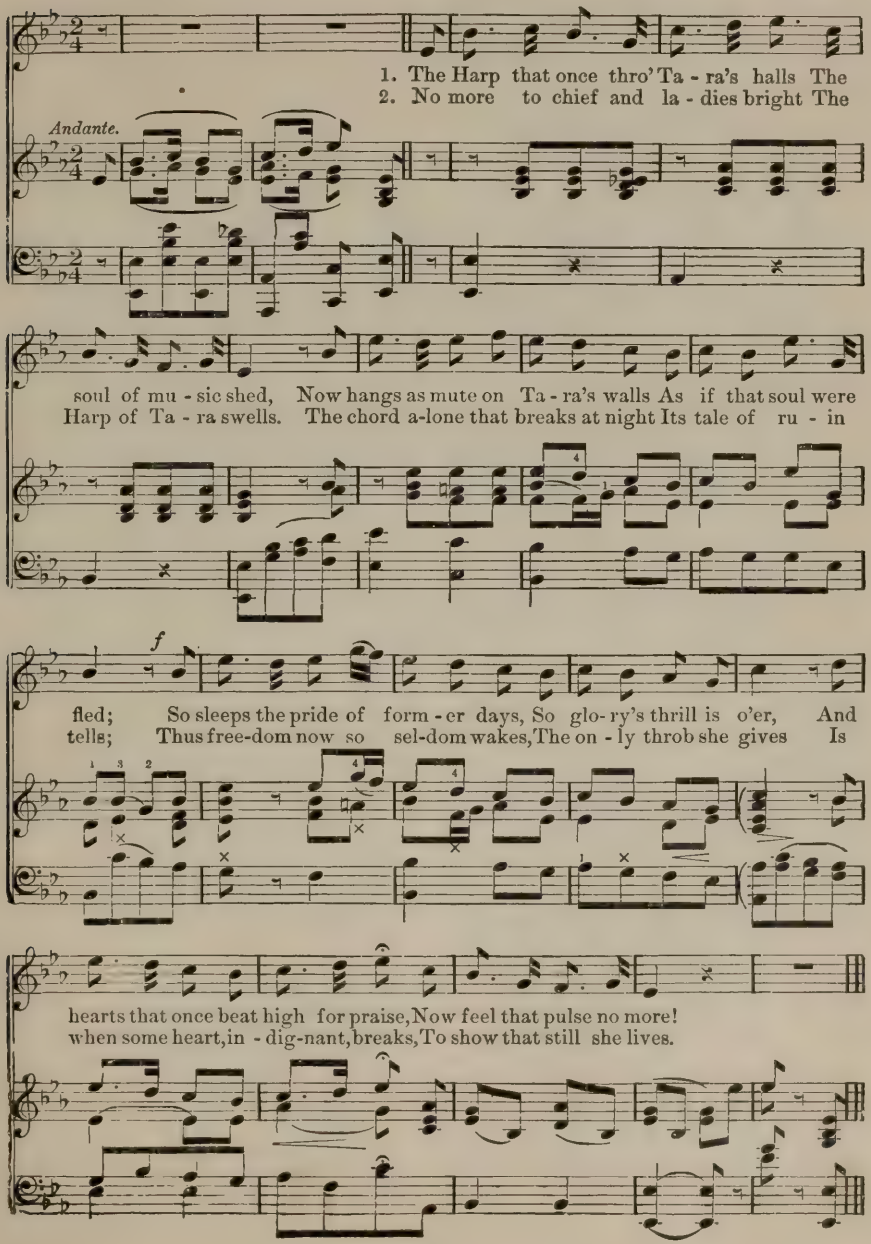
Words and Music by GEO. M. VICKERS.


Tempo di Marcia.
1. Co - lum - bia, my Coun - try! My song is of thee, Thy
2. Co - lum - bia, my Coun - try! My heart thrills with love; To
3. Co - lum - bia, my Coun - try! Earth's fair - est do - main, I
hon - or and glo - ry Mine ev - er shall be; From hill side, from val - ley O'er
thee am I loy - al, God hears me a - bove: Thy foes are my foe - men, To
hon - or thy he - roes Who for thee were slain; Thy flag still the em - blem Of


mount - ain and plain, Shall ech - o, for - ev - er, Sweet free-dom's re - frain.
thee would I give E'en life, were it need - ed, That free - dom might live.
free - dom shall be, Co - lum - bia, I love thee, Sweet home of the free.
REFRAIN.
Allegretto.
Co - lum - bia, my Coun - try, Thou beau - ti - ful land! The
world in thy light—shall be free! May God keep me stead - fast, In
heart and in hand, Still faith - ful, my Coun - try, to thee! . .

THE HARP THAT ONCE THRO' TARA'S HALLS.

MOORE.


1. The Harp that once thro' Ta - ra's halls The
2. No more to chief and la - dies bright The
Andante.
soul of mu - sic shed, Now hangs as mute on Ta - ra's walls As if that soul were
Harp of Ta - ra swells. The chord a-lone that breaks at night Its tale of ru - in
f
fled; So sleeps the pride of form - er days, So glo- ry's thrill is o'er, And
tells; Thus free-dom now so sel-dom wakes, The on - ly throb she gives Is
hearts that once beat high for praise, Now feel that pulse no more!
when some heart, in - dig-nant, breaks, To show that still she lives.

THE MUSICAL ASTERS

A PRETTY FEATURE WITH WHICH TO CONCLUDE AN ENTERTAINMENT

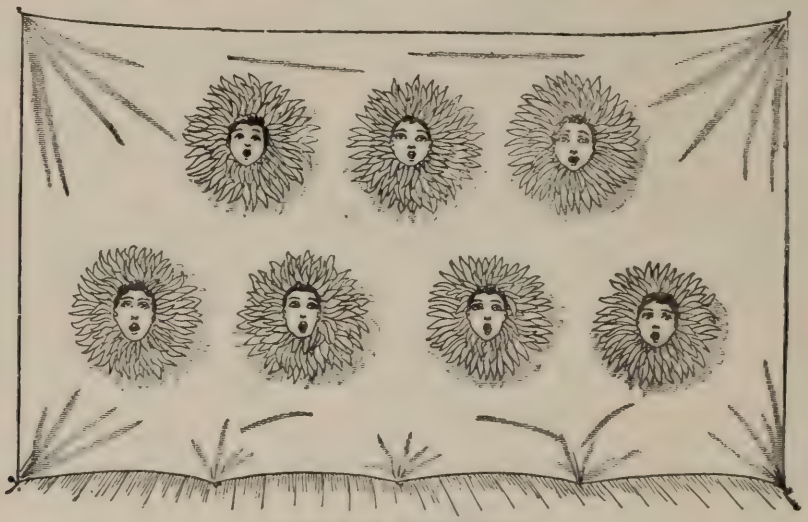


DIAGRAM OF MUSLIN SCREEN

DIRECTIONS: Seven good voices, either male or female, or both. Three young men for the top holes, and four young ladies for the lower ones, make the most effective combination. Get a piece of sheeting muslin, six feet wide and long enough to reach across the platform. By getting plenty of length, the same muslin will do for various platforms. In the centre of the muslin, at the height of five feet from the bottom, cut three round holes, the size of a human face. The holes must be three feet apart. Two feet below the three holes, cut four holes, three feet apart, as shown in the diagram. Around each hole paint the petals of the Aster flower. As these flowers are of almost every color, scarlet, orange and blue can be used with good effect.

Fasten the lower edge of the muslin to the floor of the platform; the top can be attached to a rope or wire, the ends of which are secured to the side walls.

The singers take position behind the screen, and each one places his or her face in the hole, those at the top ones standing, those at the lower ones kneeling. The seven singers are named after the seven notes in music, thus; A, B, C, D, E, F and G. Following is the manner in which the song is sung:

DEAR ANNIE LAURIE.

Tune—"Annie Laurie."

VOICE A.

MAXWELTON braes are bonnie,
Where Annie used to sigh,
And for her, 'tis said a Scotchman
Would lay him down and die.

ALL VOICES.

Would lay him down and die,
The same as you and I
For his own sweet Annie Laurie
He would lay him down and die.

VOICE B.

Her brow was like the snow-drift,
Yet warm her heart and true;
Oh, she was as fair a sweetheart
As e'er in Scotland grew.

ALL VOICES.

As e'er in Scotland grew,
Where early falls the dew;
And she was as fair a lassie,
As e'er in Scotland grew.

VOICE C.

Her feet 'tis said were dainty,
Yet no one ever knew;
Either from a song or story,
The number of her shoe,

ALL VOICES.

The number of her shoe,
Nor do they give a clue:
Yet still she loved a Scotchman,
And for that she gets her due.

VOICE D.

Her voice was low and dulcet,
A charm that all folks prize;
And her blue eyes in their splendor
Outvied the azure skies.

ALL VOICES.

Outvied the azure skies,
With all that this implies;
Yet we know gray, black, or brown ones
Are sure to charm likewise.

VOICE E.

Somewhere, an Annie Laurie,
Somewhere, a Scotchman dwells;
And for both, each heart in whispers
The same old story tells.

ALL VOICES.

The same old story tells,
That works its mystic spells;
For we're all Scotch lads and lassies,
Wherever true love dwells.

VOICE F.

Let all praise Annie Laurie,
And him who for her sighed;
And we'll hope, though 'tis not mentioned,
He won her for his bride.

ALL VOICES.

He won her for his bride,
For hard, indeed, he tried;
And we'll hope, though oft disheartened,
He laid not down and died.

VOICE G.

Farewell to Annie Laurie,
That maiden pure and true;
All the world will love her ever,
'Twill love the Scotchman, too.

ALL VOICES.

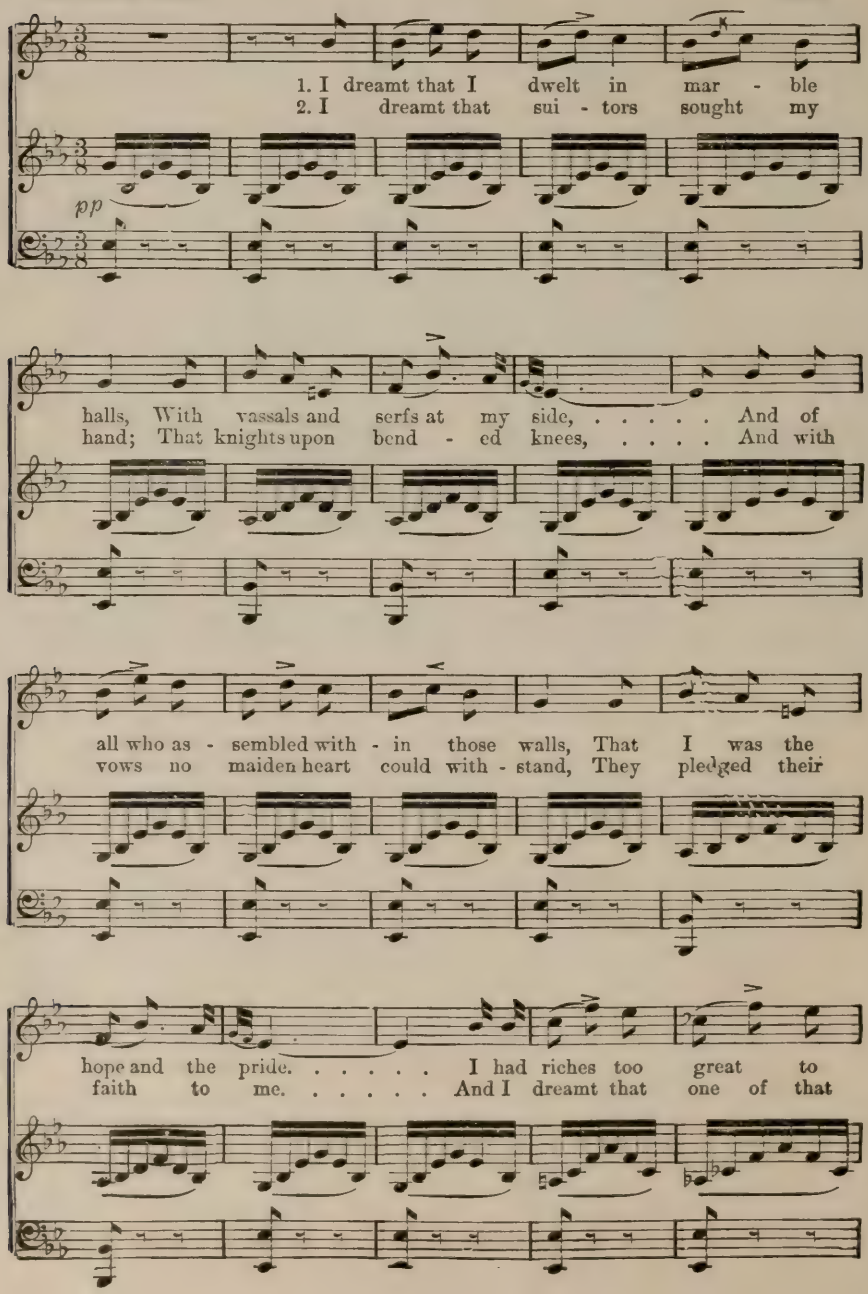
'Twill love the Scotchman, too,
For what he meant to do;
But we'll all love Annie Laurie
For her heart so warm and true.

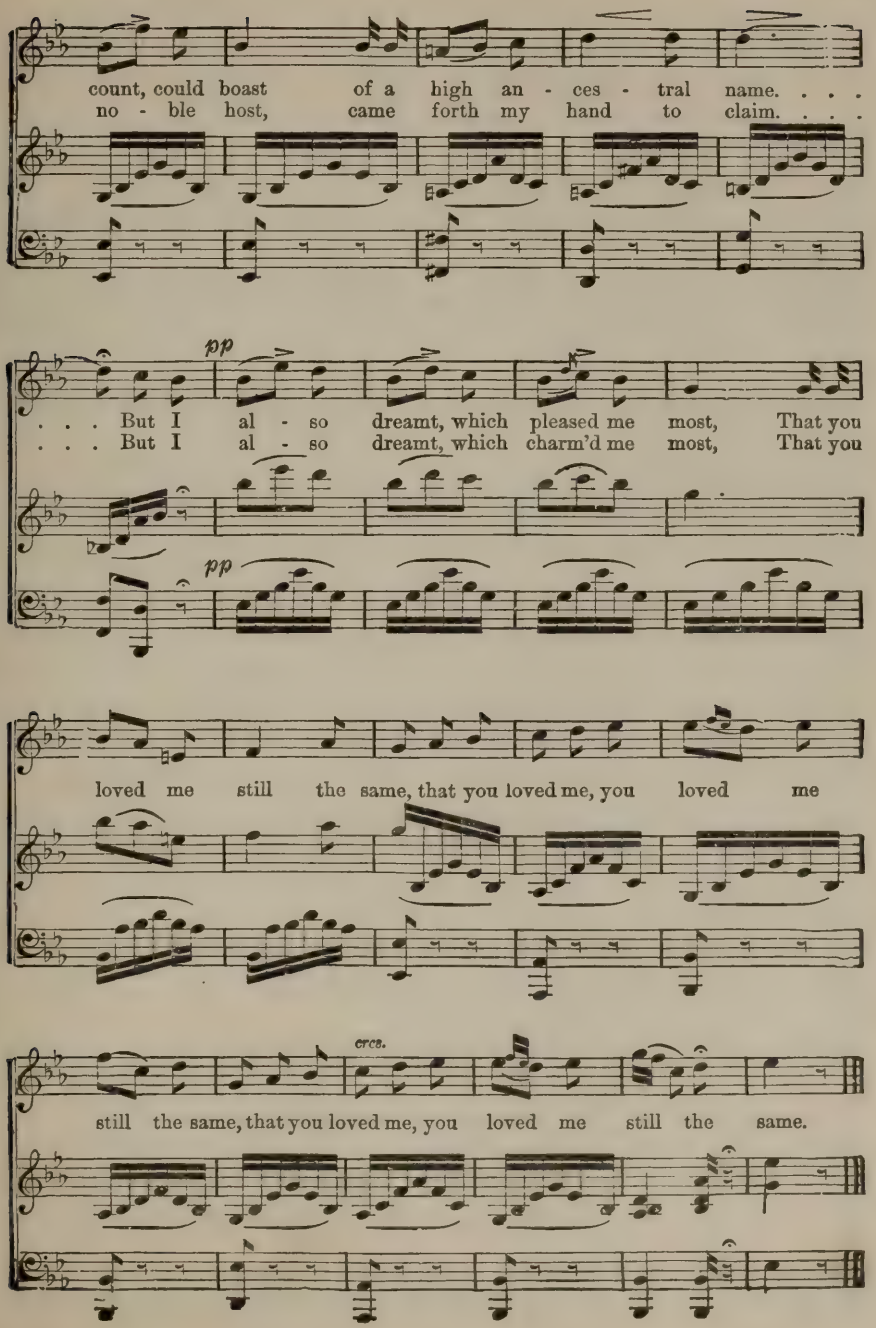
THE END.

NOTE.—Any song can be adapted to this form of entertainment, and all that is necessary is to apportion the words among the several singers.

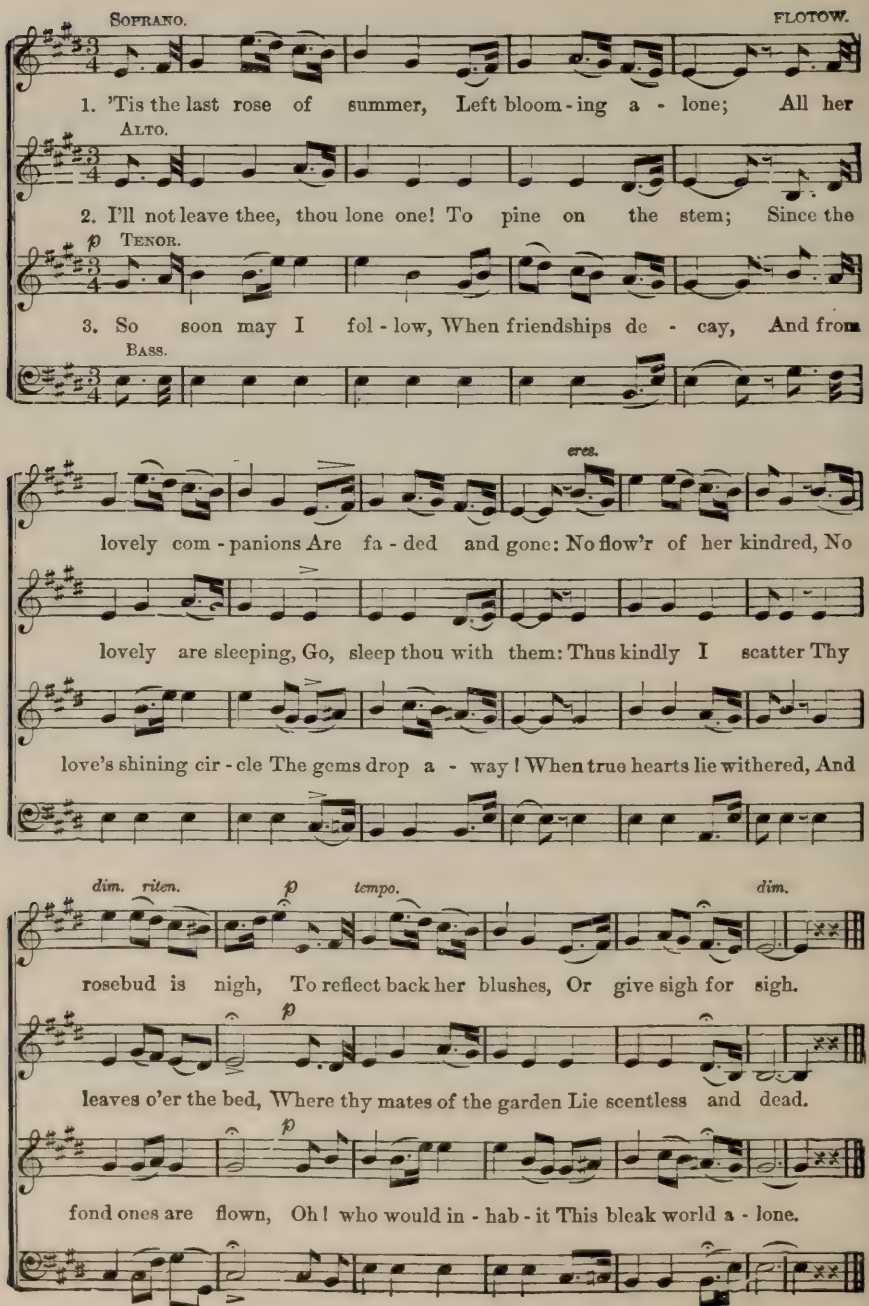
I DREAMT THAT I DWELT IN MARBLE HALLS.

"BOHEMIAN GIRL." BALFE.


1. I dreamt that I dwelt in mar - ble
2. I dreamt that sui - tors sought my
pp
halls, With vassals and serfs at my side, ... And of
hand; That knights upon bend - ed knees, ... And with
all who as - sembled with - in those walls, That I was the
vows no maiden heart could with - stand, They pledged their
hope and the pride. . . . . I had riches too great to
faith to me. . . . . And I dreamt that one of that


count, could boast of a high an - ces - tral name. . . .
no - ble host, came forth my hand to claim. . . .
pp
. . . But I al - so dreamt, which pleased me most, That you
. . . But I al - so dreamt, which charm'd me most, That you
pp
loved me still the same, that you loved me, you loved me
cres.
still the same, that you loved me, you loved me still the same.

'TIS THE LAST ROSE OF SUMMER.

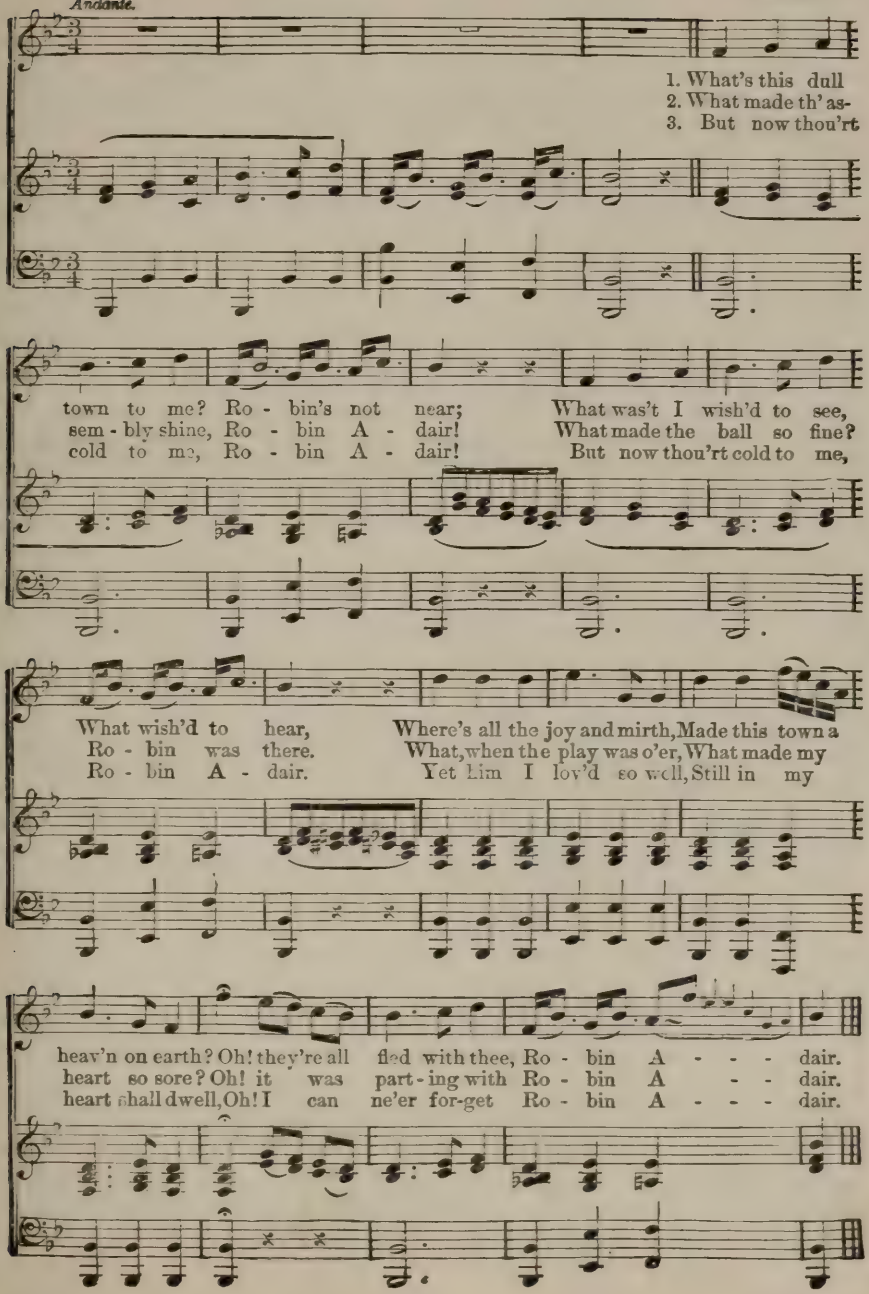

Soprano.
Flotow.
1. 'Tis the last rose of summer, Left bloom-ing a - lone; All her
Alto.
2. I'll not leave thee, thou lone one! To pine on the stem; Since the
p
Tenor.
3. So soon may I fol - low, When friendships de - cay, And from
Bass.
eres.
lovely com - panions Are fa - ded and gone: No flow'r of her kindred, No
lovely are sleeping, Go, sleep thou with them: Thus kindly I scatter Thy
love's shining cir - cle The gems drop a - way! When true hearts lie withered, And
dim. riten.
p
tempo.
dim.
rosebud is nigh, To reflect back her blushes, Or give sigh for sigh.
p
leaves o'er the bed, Where thy mates of the garden Lie scentless and dead.
p
fond ones are flown, Oh! who would in - hab - it This bleak world a - lone.

ROBIN ADAIR.

KINGSLEY.

Andante.

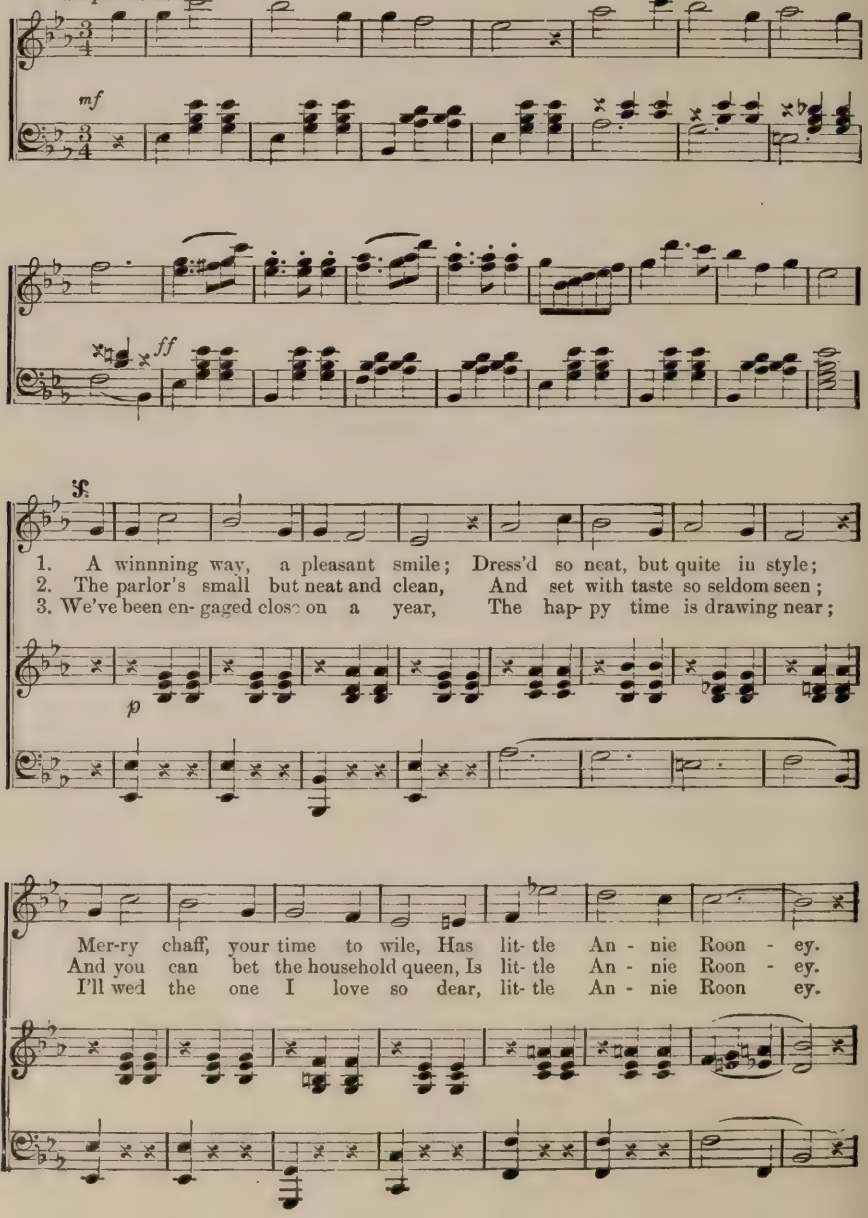
1. What's this dull
2. What made th' as-
3. But now thou'rt

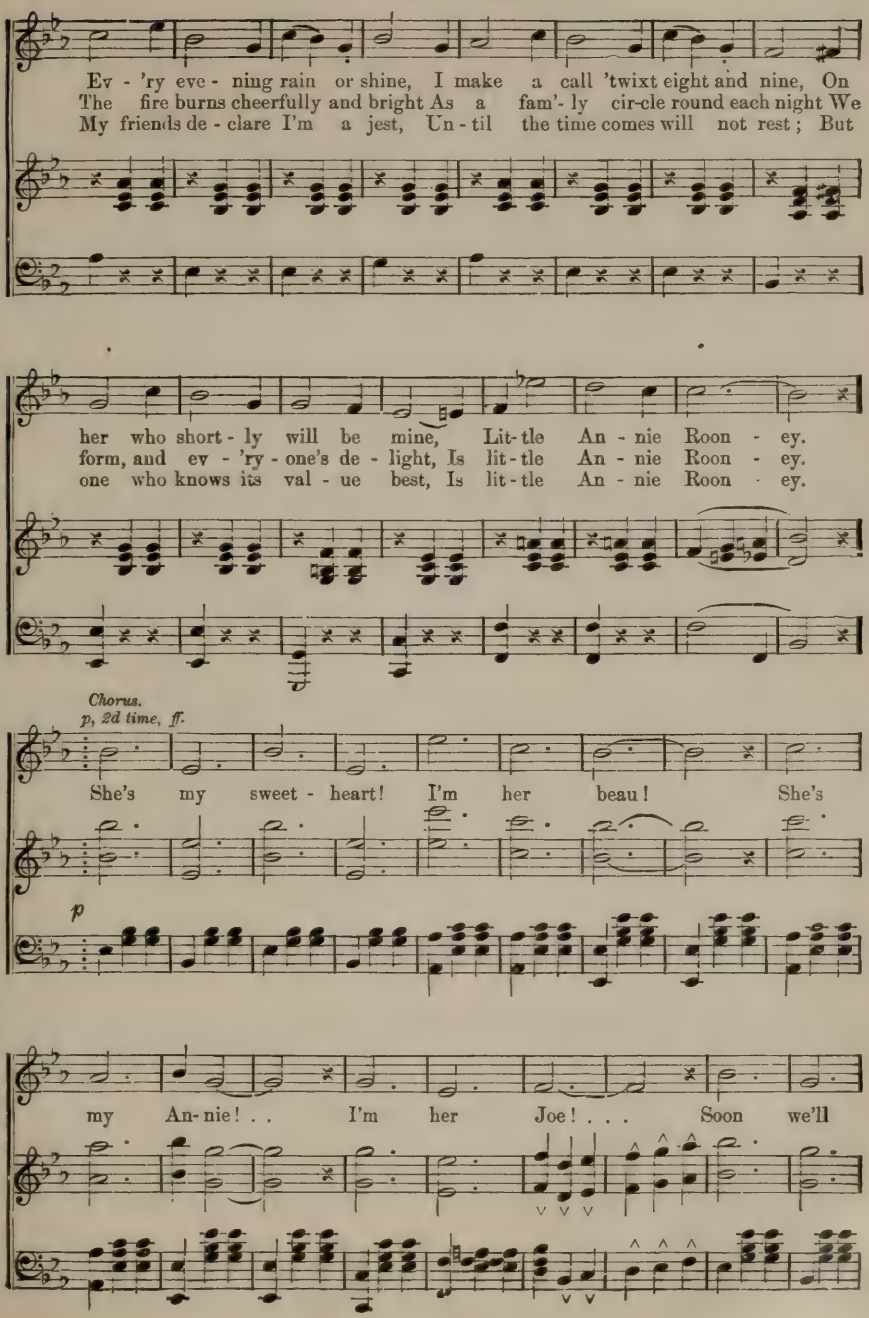

town to me? Ro - bin's not near; What was't I wish'd to see,
sem - bly shine, Ro - bin A - dair! What made the ball so fine?
cold to me, Ro - bin A - dair! But now thou'rt cold to me,
What wish'd to hear, Where's all the joy and mirth, Made this town a
Ro - bin was there. What, when the play was o'er, What made my
Ro - bin A - dair. Yet Him I lov'd so well, Still in my
heav'n on earth? Oh! they're all fled with thee, Ro - bin A - - - dair.
heart so sore? Oh! it was part - ing with Ro - bin A - - - dair.
heart shall dwell, Oh! I can ne'er for-get Ro - bin A - - - dair.

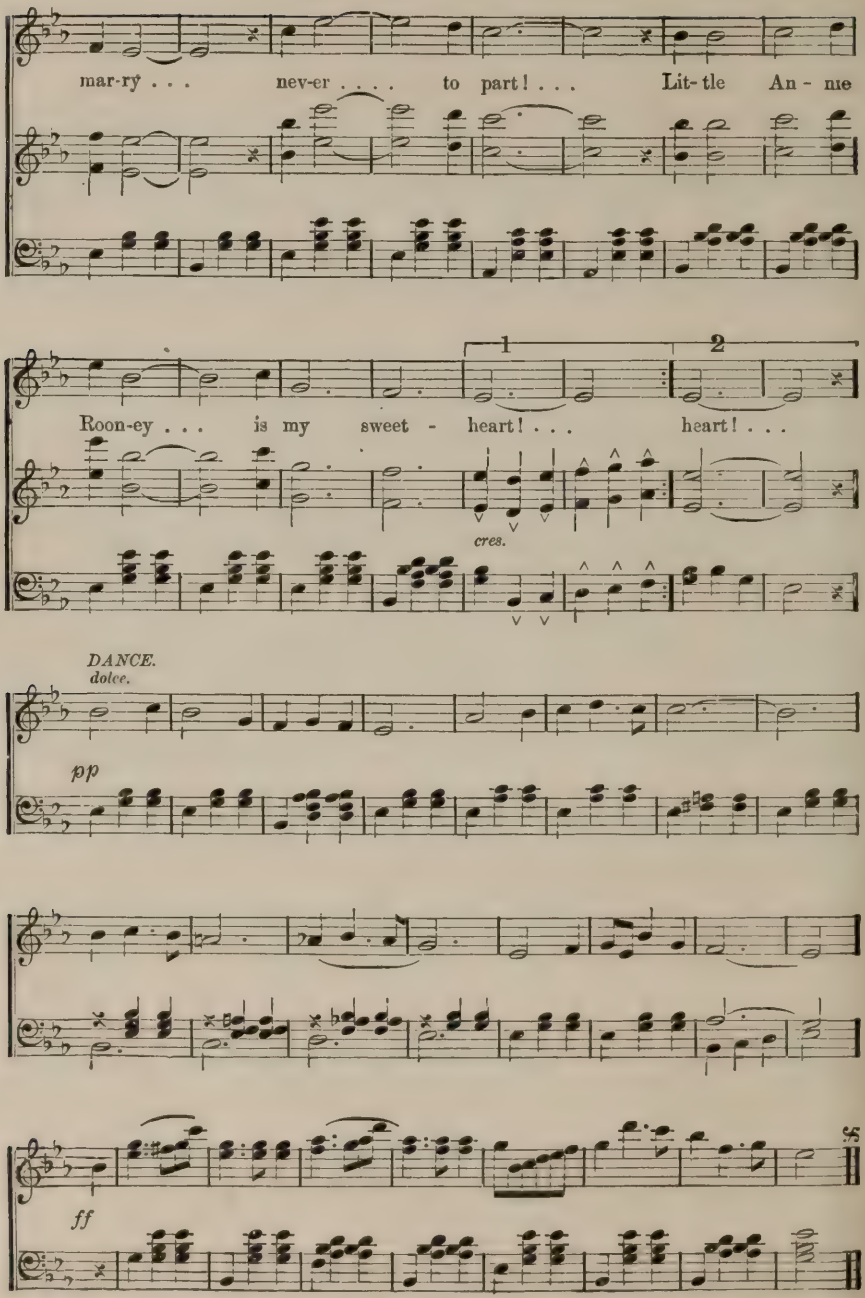
LITTLE ANNIE ROONEY.

WRITTEN AND COMPOSED BY MICHAEL NOLAN.

Tempo di Valse.

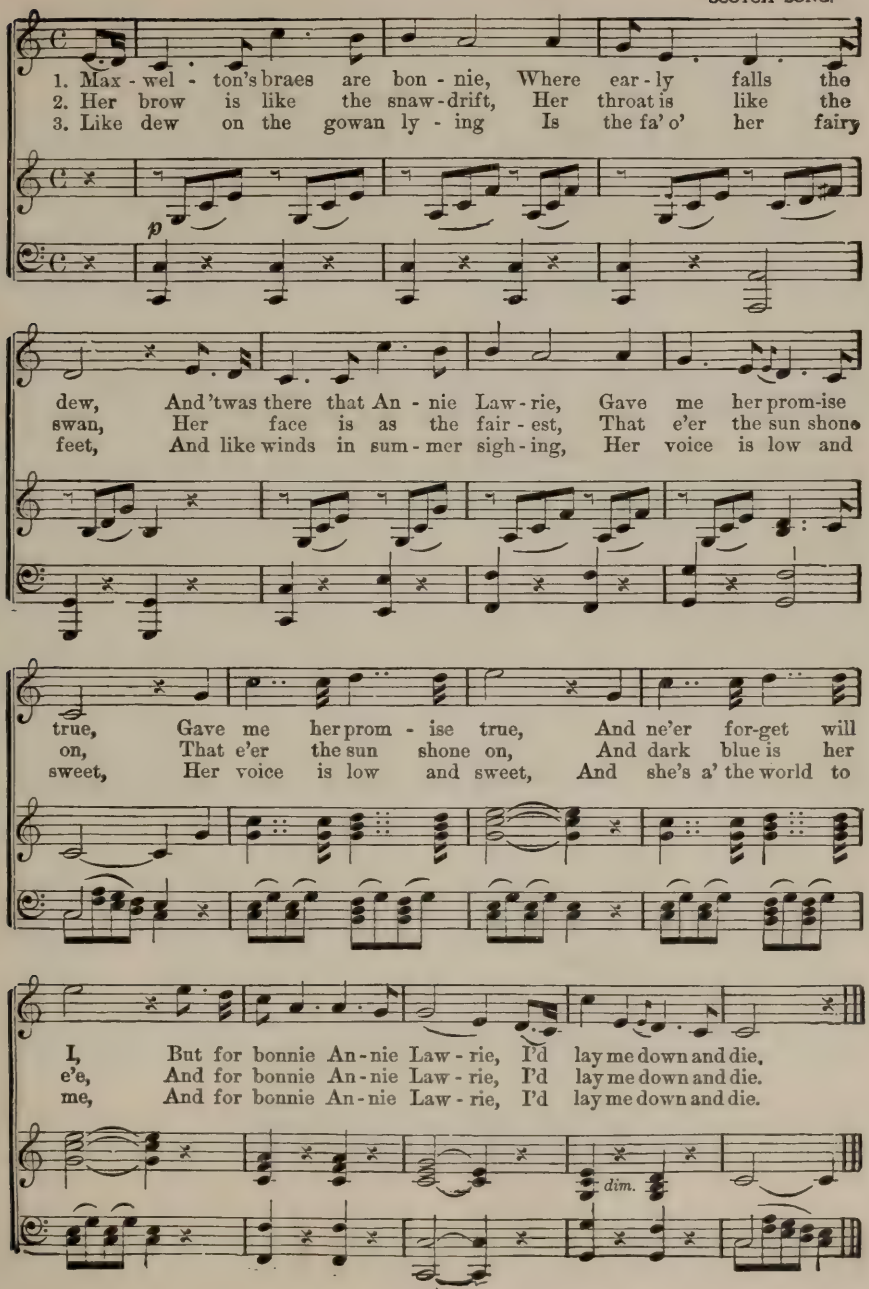

mf
ff
f
1. A winnning way, a pleasant smile; Dress'd so neat, but quite in style;
2. The parlor's small but neat and clean, And set with taste so seldom seen;
3. We've been en- gaged close on a year, The hap- py time is drawing near;
p
Mer-ry chaff, your time to wile, Has lit- tle An - nie Roon - ey.
And you can bet the household queen, Is lit- tle An - nie Roon - ey.
I'll wed the one I love so dear, lit- tle An - nie Roon ey.


Ev - 'ry eve - ning rain or shine, I make a call 'twixt eight and nine, On
The fire burns cheerfully and bright As a fam'- ly cir-cle round each night We
My friends de - clare I'm a jest, Un - til the time comes will not rest; But
her who short - ly will be mine, Lit-tle An - nie Roon - ey.
form, and ev - 'ry - one's de - light, Is lit - tle An - nie Roon - ey.
one who knows its val - ue best, Is lit - tle An - nie Roon - ey.
Chorus.
p, 2d time, ff.
She's my sweet - heart! I'm her beau! She's
p
my An- nie! . . I'm her Joe! . . . Soon we'll


mar-ry . . . nev-er . . . . to part! . . . Lit-tle An-nie
1
2
Roon-ey . . . is my sweet - heart! . . . heart! . . .
cres.
DANCE.
dolce.
pp
ff

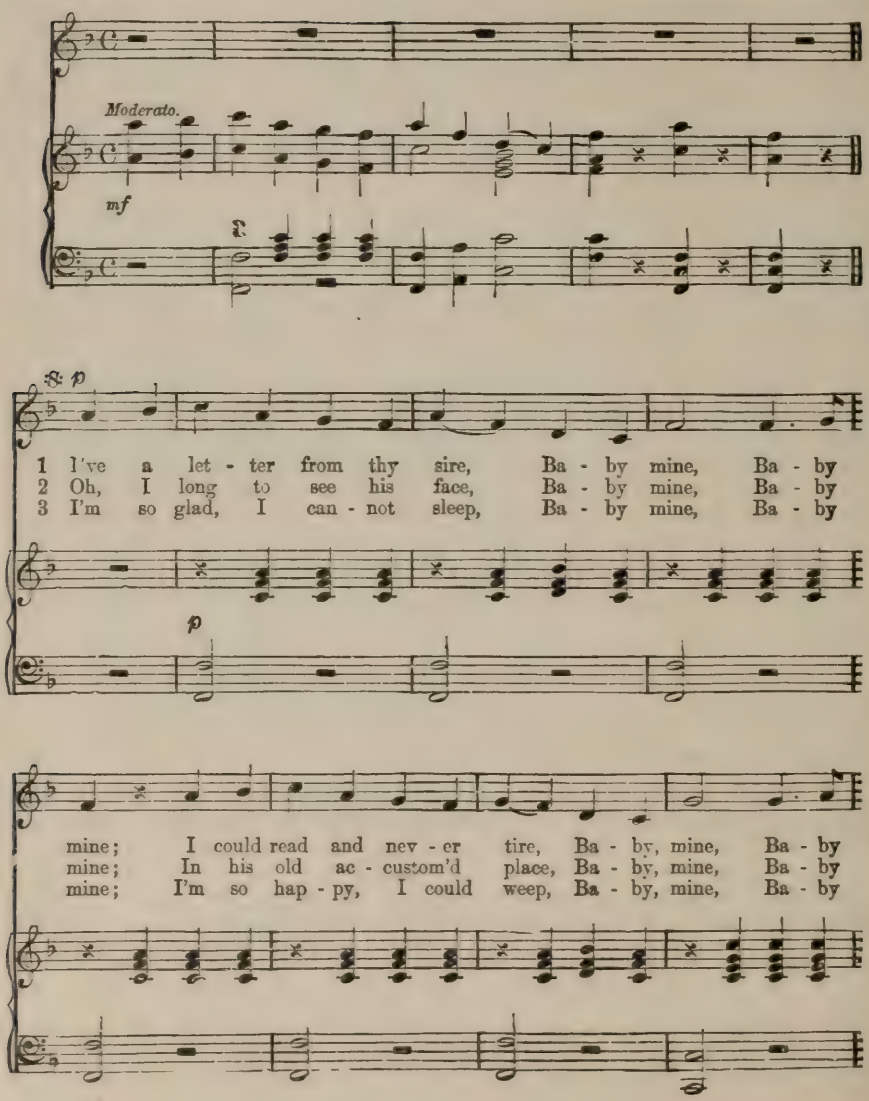
ANNIE LAWRIE.

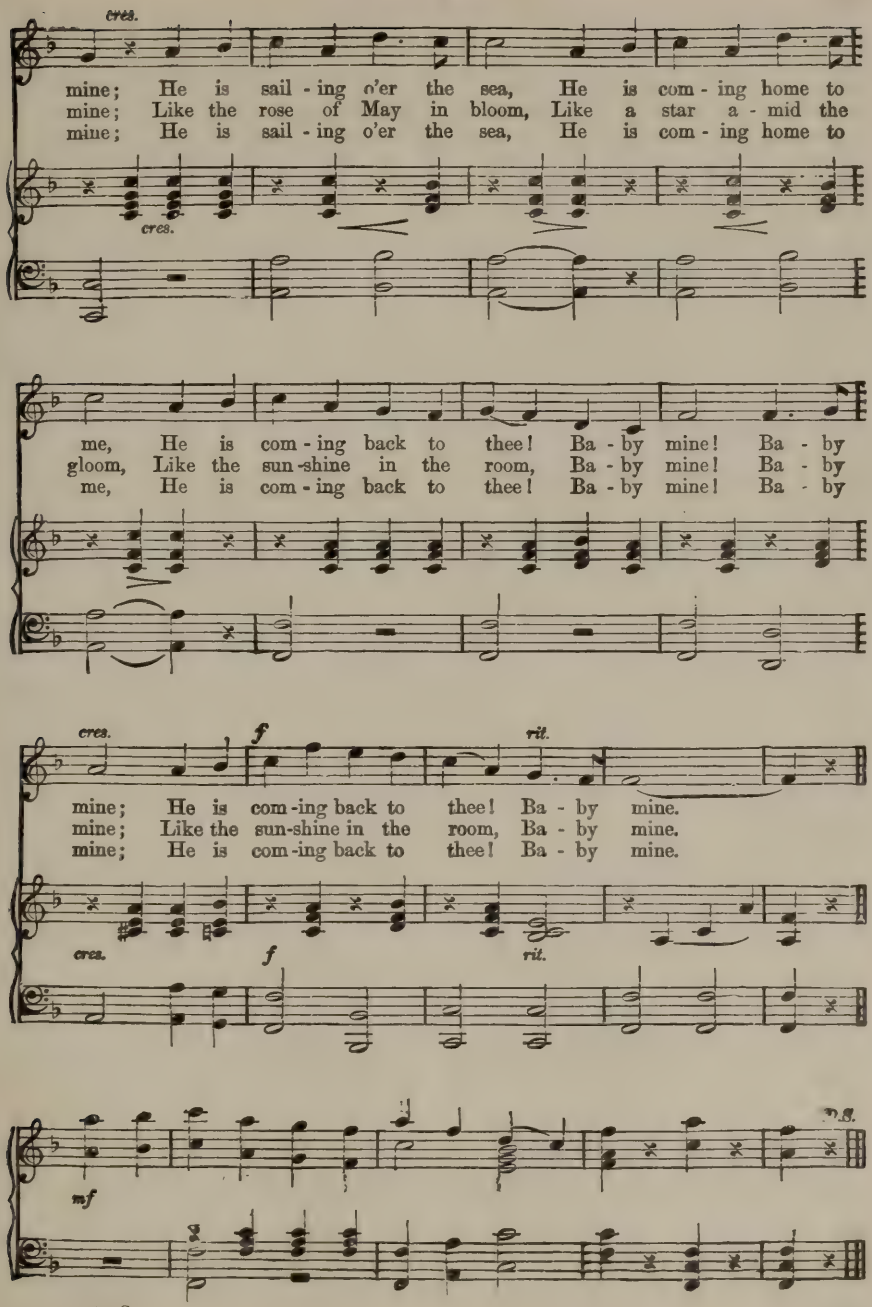
SCOTCH SONG.


1. Max - wel - ton's braes are bon - nie, Where ear - ly falls the
2. Her brow is like the snaw - drift, Her throat is like the
3. Like dew on the gowan ly - ing Is the fa' o' her fairy
p
dew, And 'twas there that An - nie Law - rie, Gave me her prom-ise
swan, Her face is as the fair - est, That e'er the sun shone
feet, And like winds in sum - mer sigh - ing, Her voice is low and
true, Gave me her prom - ise true, And ne'er for-get will
on, That e'er the sun shone on, And dark blue is her
sweet, Her voice is low and sweet, And she's a' the world to
I, But for bonnie An - nie Law - rie, I'd lay me down and die.
e'e, And for bonnie An - nie Law - rie, I'd lay me down and die.
me, And for bonnie An - nie Law - rie, I'd lay me down and die.
dim.

"BABY MINE."

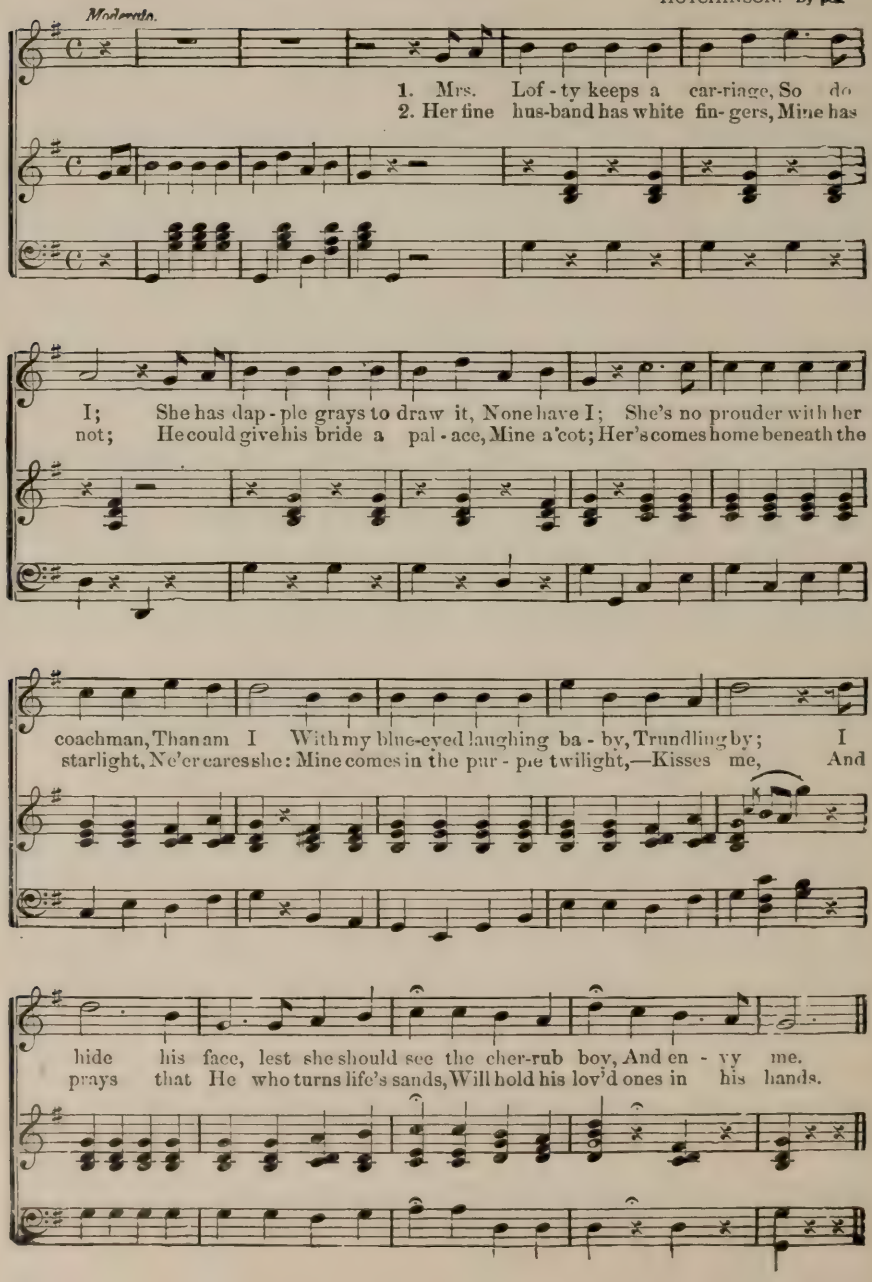
CHARLES MACKEY. ARCHIBALD JOHNSTON.

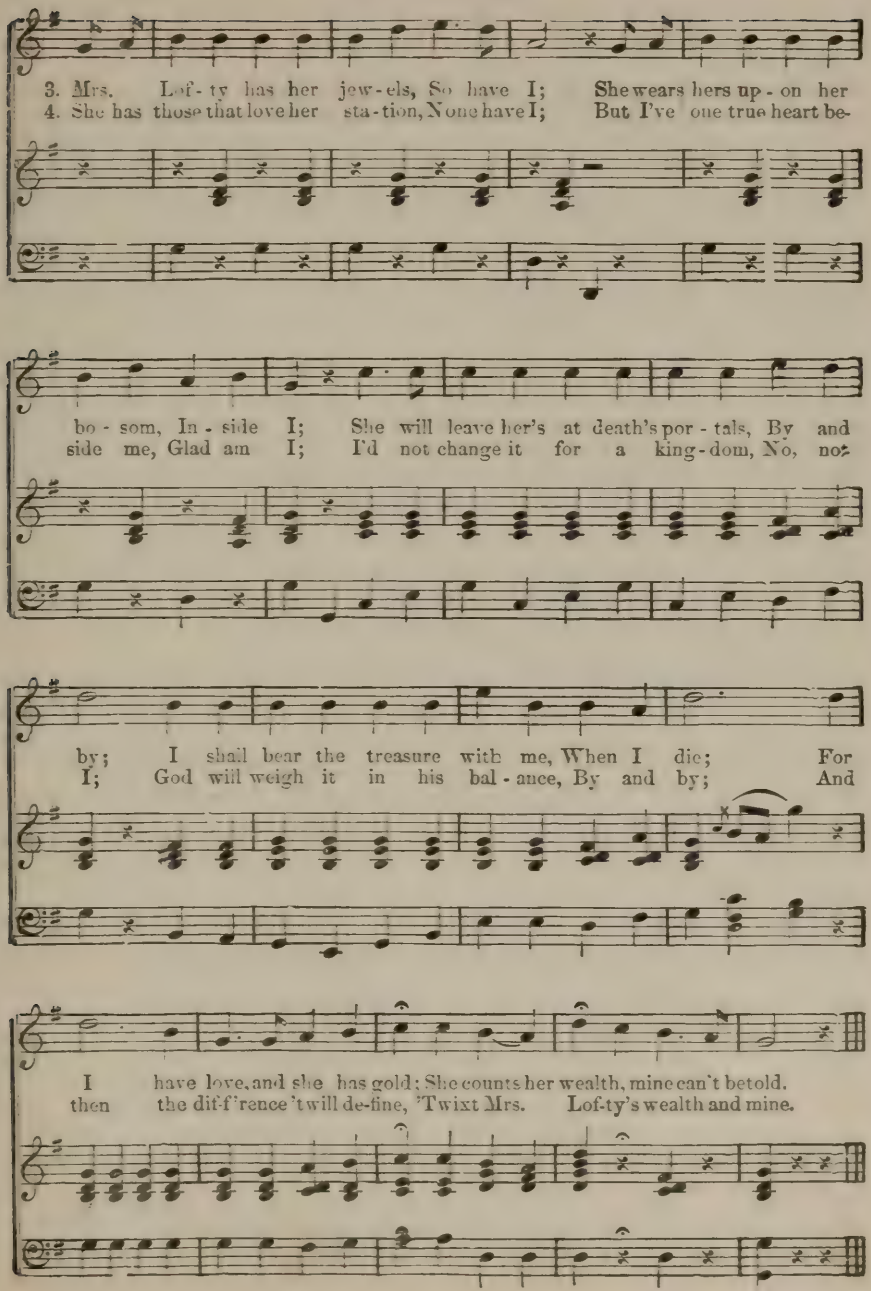

Moderato.
mf
p
1 I've a let - ter from thy sire, Ba - by mine, Ba - by
2 Oh, I long to see his face, Ba - by mine, Ba - by
3 I'm so glad, I can - not sleep, Ba - by mine, Ba - by
p
mine; I could read and nev - er tire, Ba - by, mine, Ba - by
mine; In his old ac - custom'd place, Ba - by, mine, Ba - by
mine; I'm so hap - py, I could weep, Ba - by, mine, Ba - by


cres.
mine; He is sail - ing o'er the sea, He is com - ing home to
mine; Like the rose of May in bloom, Like a star a - mid the
mine; He is sail - ing o'er the sea, He is com - ing home to
cres.
me, He is com - ing back to thee! Ba - by mine! Ba - by
gloom, Like the sun-shine in the room, Ba - by mine! Ba - by
me, He is com - ing back to thee! Ba - by mine! Ba - by
cres.
f
rit.
mine; He is com-ing back to thee! Ba - by mine.
mine; Like the sun-shine in the room, Ba - by mine.
mine; He is com-ing back to thee! Ba - by mine.
cres.
f
rit.
D.S.
mf

MRS. LOFTY AND I.

HUTCHINSON. By per.

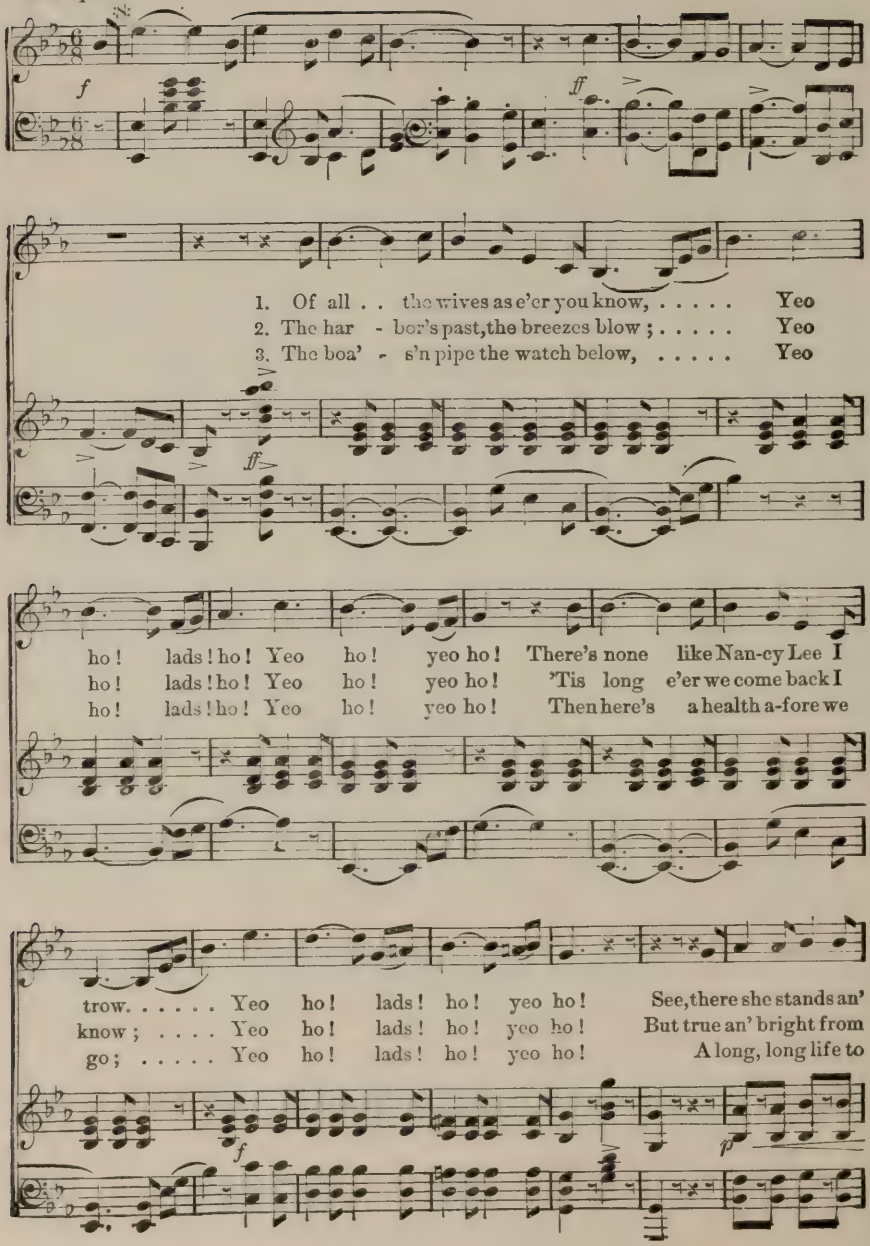

Moderato.
1. Mrs. Lof - ty keeps a car-riage, So do
2. Her fine hus-band has white fin- gers, Mine has
I; She has dap - ple grays to draw it, None have I; She's no prouder with her
not; He could give his bride a pal - ace, Mine a cot; Her's comes home beneath the
coachman, Than am I With my blue-eyed laughing ba - by, Trundling by; I
starlight, Ne'er cares she: Mine comes in the pur - ple twilight,—Kisses me, And
hide his face, lest she should see the cher-rub boy, And en - vy me.
prays that He who turns life's sands, Will hold his lov'd ones in his hands.

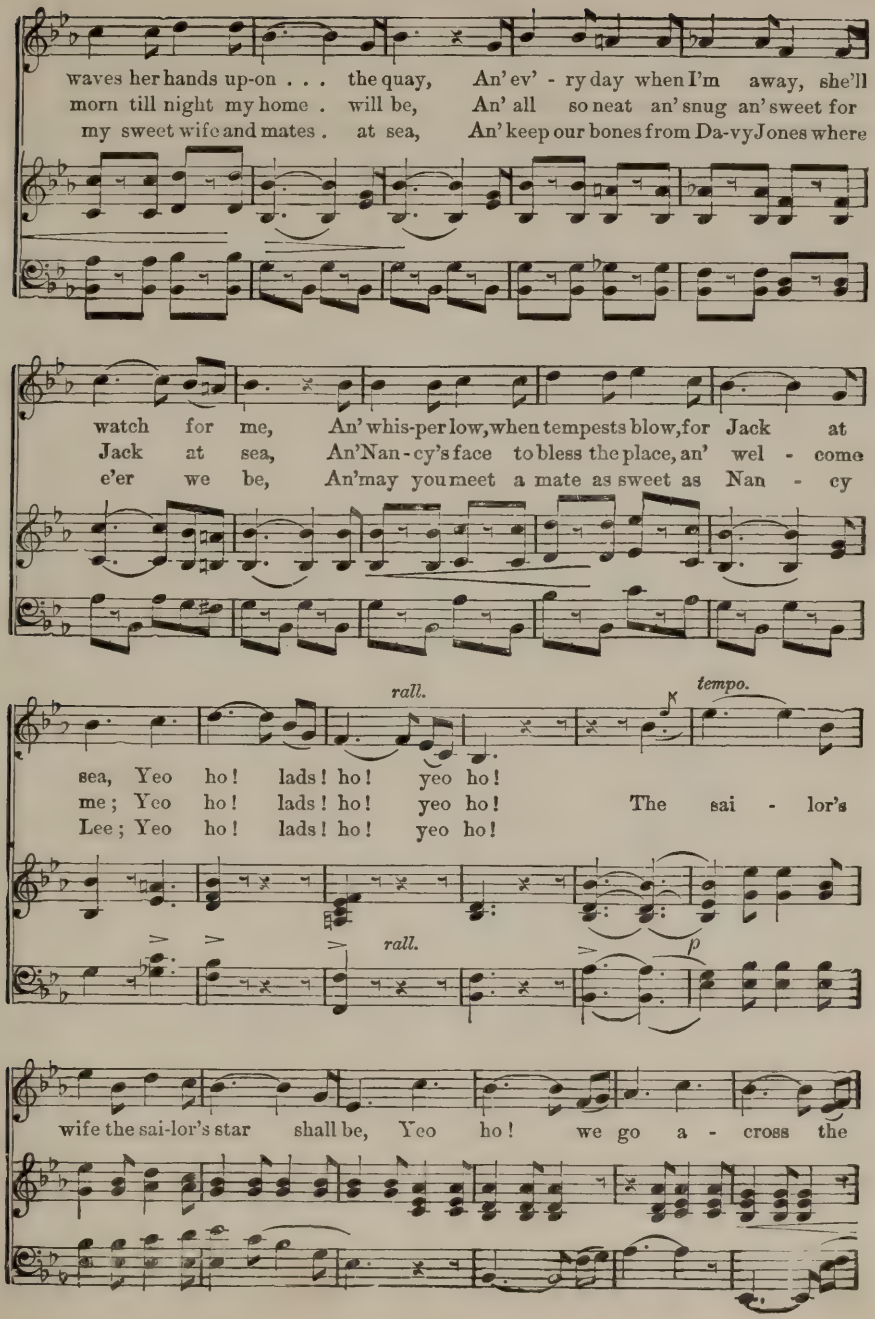

3. Mrs. Lof-ty has her jew-els, So have I; She wears hers up-on her bo-som, In-side I; She will leave her's at death's por-tals, By and by; I shall bear the treasure with me, When I die; For I have love, and she has gold; She counts her wealth, mine can't be told.
4. She has those that love her sta-tion, None have I; But I've one true heart be-side me, Glad am I; I'd not change it for a king-dom, No, not I; God will weigh it in his bal-ance, By and by; And then the dif-f'rence 'twill de-fine, 'Twixt Mrs. Lof-ty's wealth and mine.

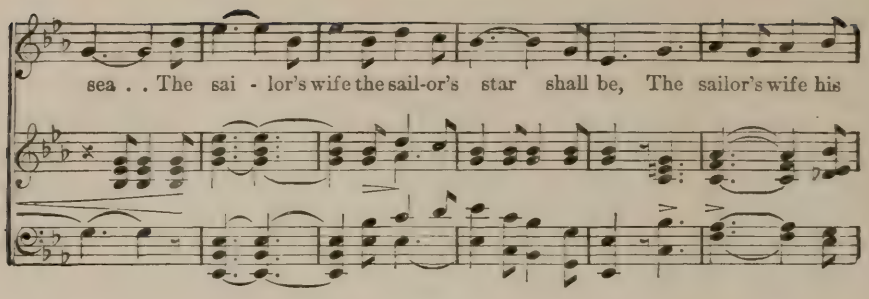
NANCY LEE.

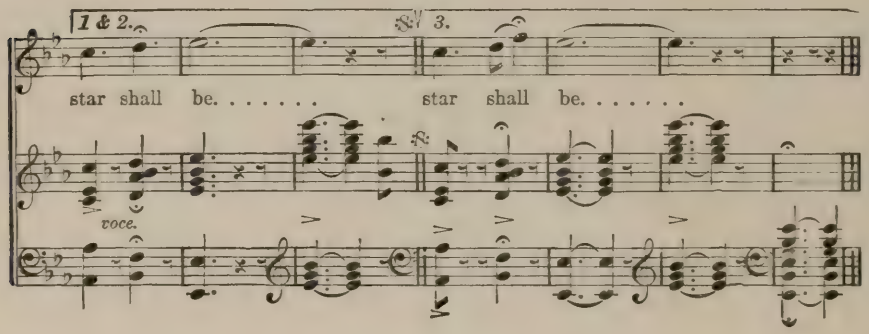
WEATHERLY. ADAMS.

With Spirit.


f
ff
1. Of all . . the wives as e'er you know, ... Yeo
2. The har - bor's past, the breezes blow; . . . . . Yeo
3. The boa' - s'n pipe the watch below, ... Yeo
ho! lads! ho! Yeo ho! yeo ho! There's none like Nan-cy Lee!
ho! lads! ho! Yeo ho! yeo ho! 'Tis long e'er we come back!
ho! lads! ho! Yeo ho! yeo ho! Then here's a health a-fore we
trow. . . . . Yeo ho! lads! ho! yeo ho! See, there she stands an'
know; . . . . Yeo ho! lads! ho! yeo ho! But true an' bright from
go; . . . . . Yeo ho! lads! ho! yeo ho! A long, long life to
f
p

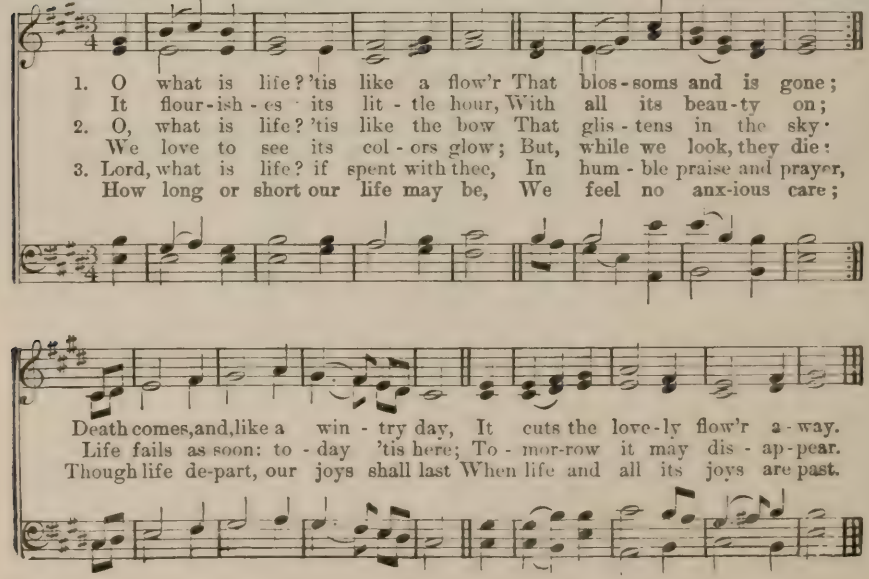

waves her hands up-on . . . the quay, An' ev' - ry day when I'm away, she'll
morn till night my home . will be, An' all so neat an' snug an' sweet for
my sweet wife and mates . at sea, An' keep our bones from Da-vy Jones where
watch for me, An' whis-per low, when tempests blow, for Jack at
Jack at sea, An' Nan-cy's face to bless the place, an' wel - come
e'er we be, An' may you meet a mate as sweet as Nan - cy
rall.
tempo.
sea, Yeo ho! lads! ho! yeo ho!
me; Yeo ho! lads! ho! yeo ho! The sai - lor's
Lee; Yeo ho! lads! ho! yeo ho!
rall.
p
wife the sai-lor's star shall be, Yeo ho! we go a - cross the





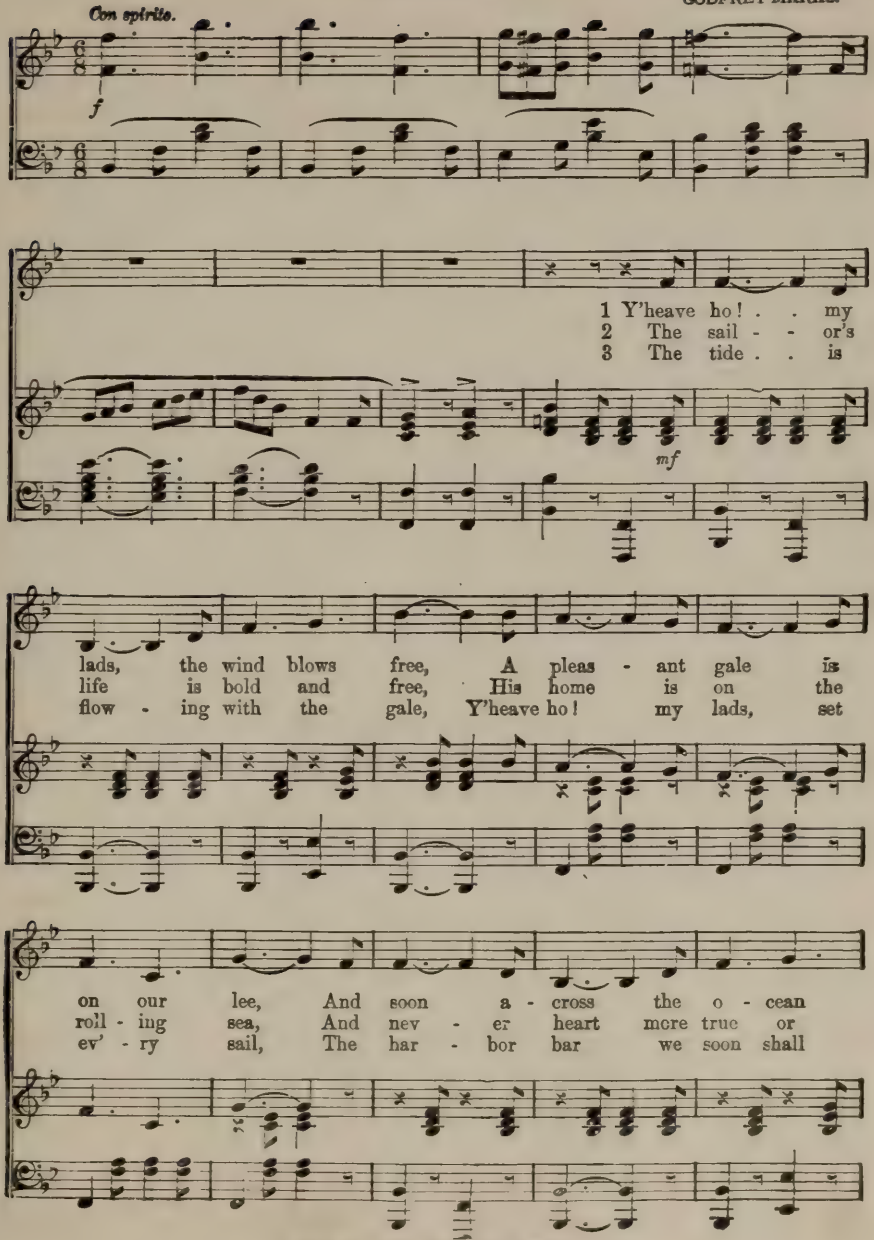
WILLCOTT.

Andantino. MARSHALL. By per.


1. O what is life? 'tis like a flow'r That blos-soms and is gone;
It flour-ish-es its lit-tle hour, With all its beau-ty on;
2. O, what is life? 'tis like the bow That glis-tens in the sky·
We love to see its col-ors glow; But, while we look, they die:
3. Lord, what is life? if spent with thee, In hum-ble praise and prayer,
How long or short our life may be, We feel no anx-ious care;
Death comes, and, like a win-try day, It cuts the love-ly flow'r a-way.
Life fails as soon: to-day 'tis here; To-mor-row it may dis-ap-pear.
Though life de-part, our joys shall last When life and all its joys are past.

SAILING.

GODFREY MARKS.


Con spirito.
f
1 Y'heave ho! . . my
2 The sail - - or's
3 The tide . . is
mf
lads, the wind blows free, A pleas - ant gale is
life is bold and free, His home is on the
flow - ing with the gale, Y'heave ho! my lads, set
on our lee, And soon a - cross the o - cean
roll - ing sea, And nev - er heart more true or
ev' - ry sail, The har - bor bar we soon shall

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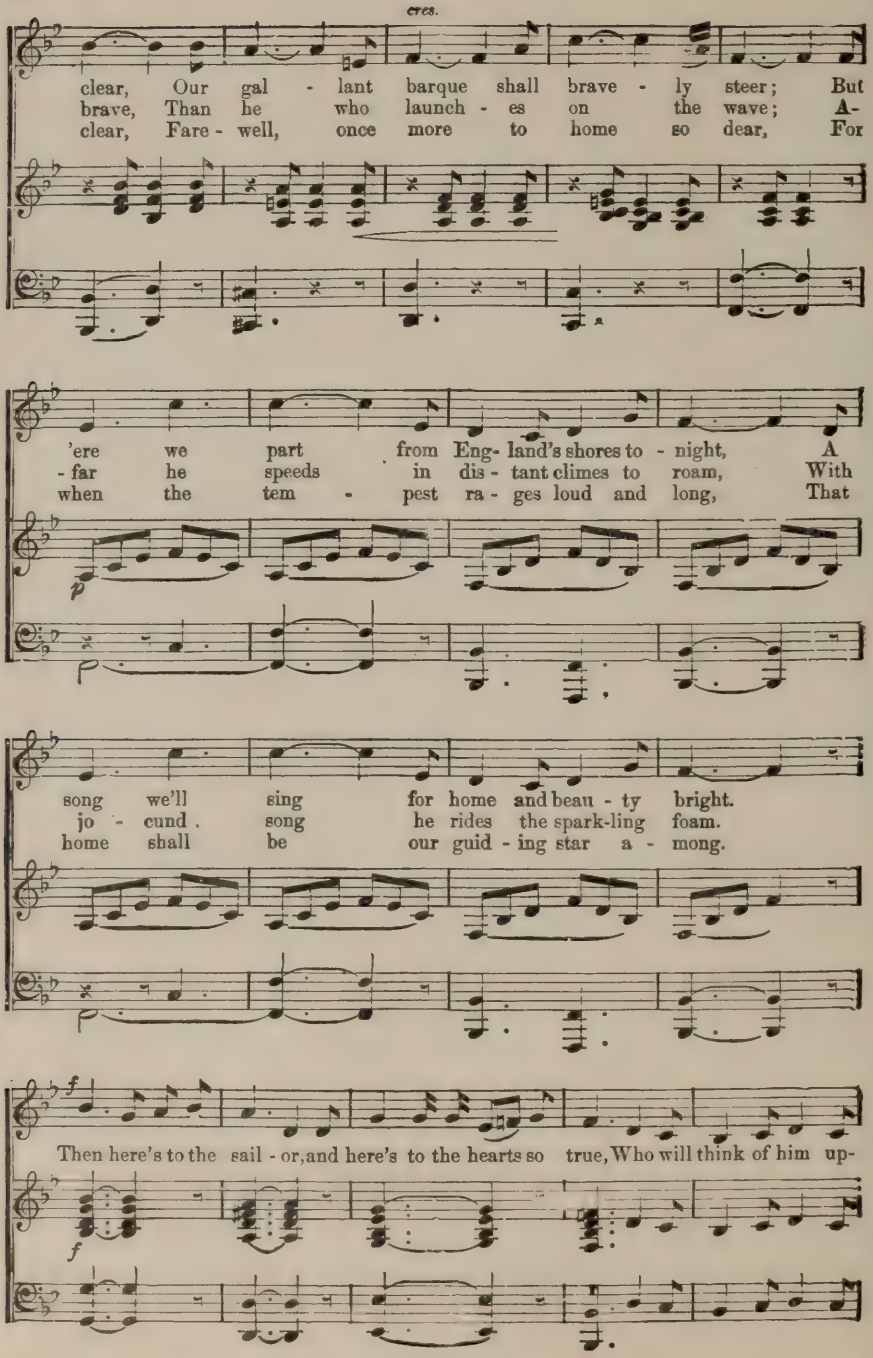
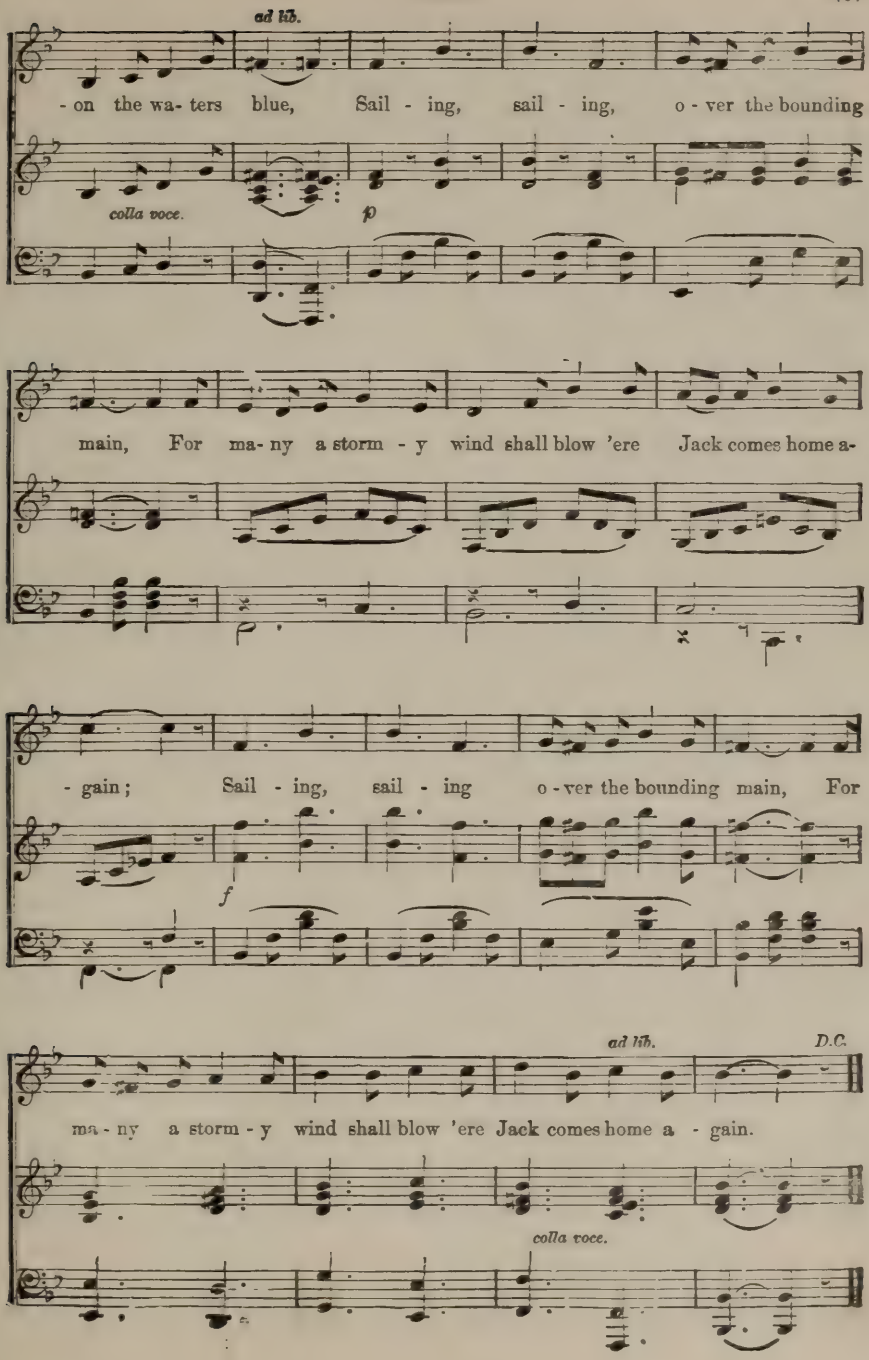
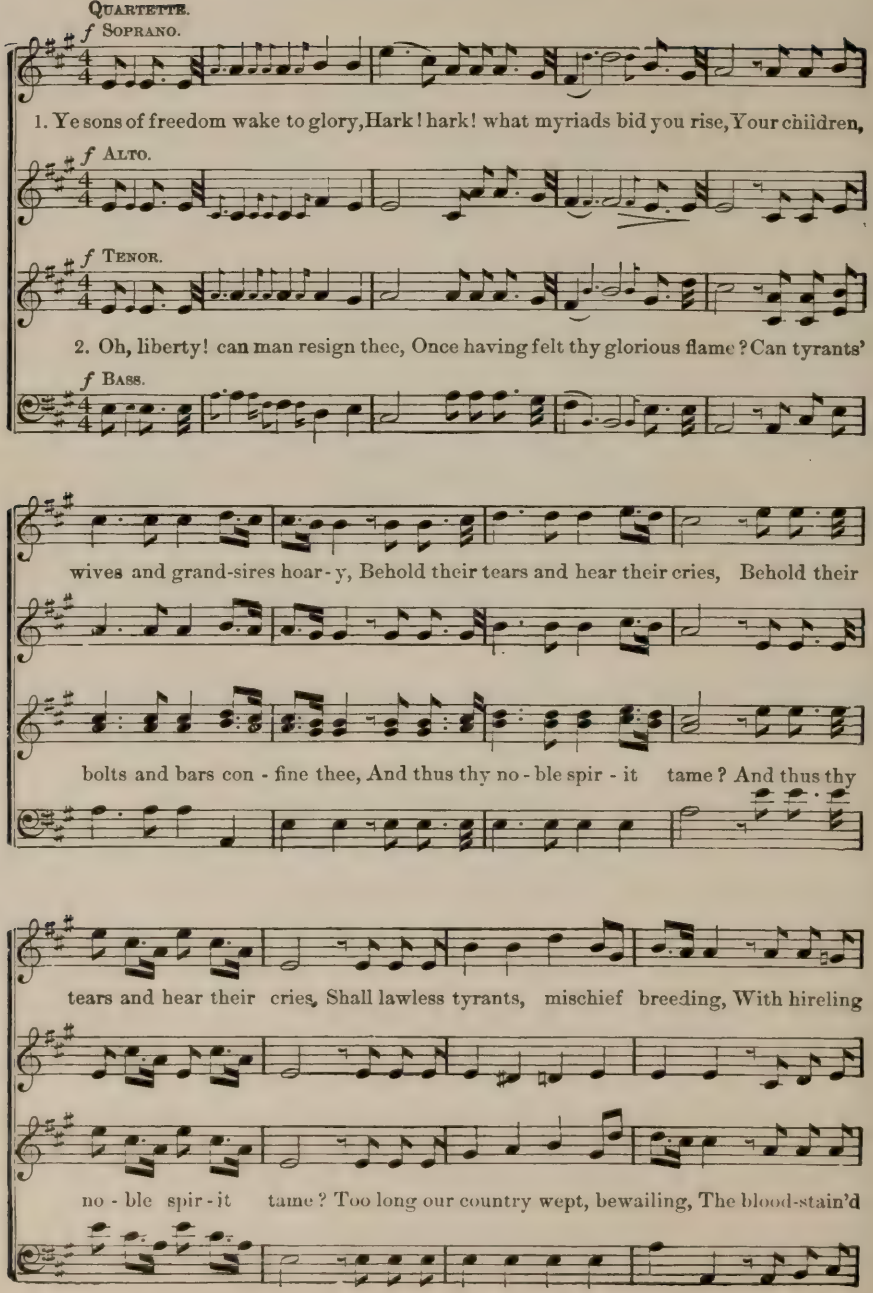
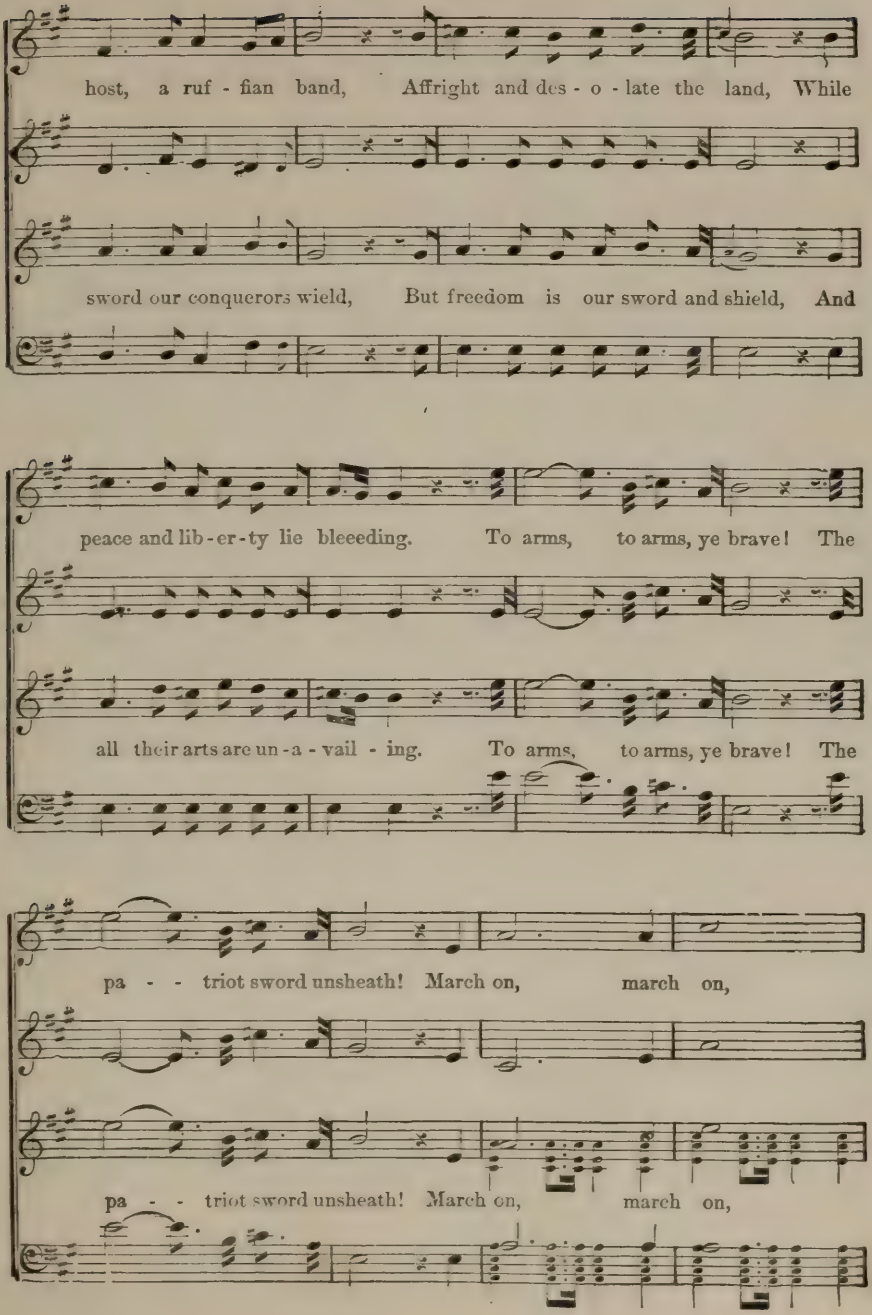
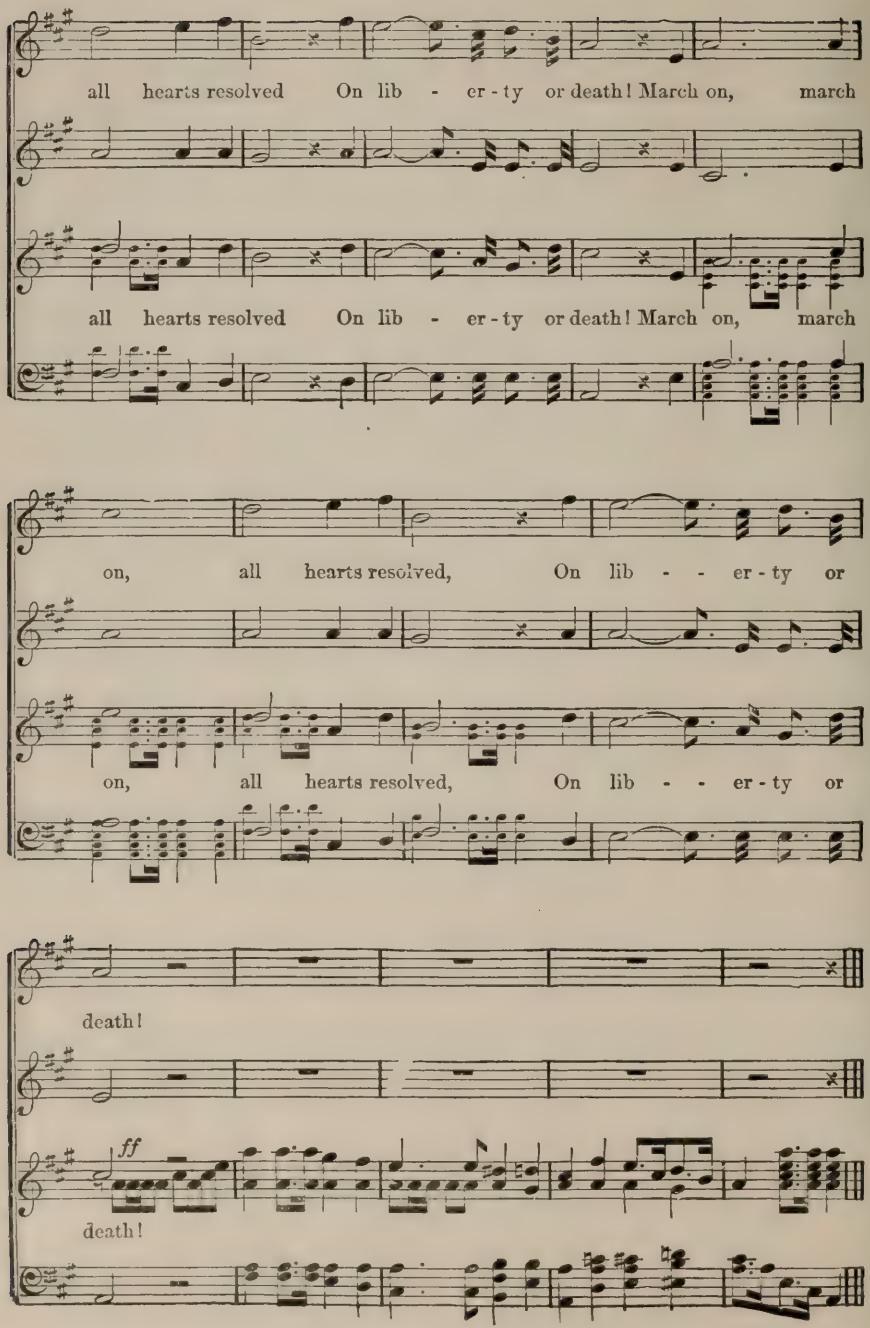

cres.
clear, Our gal - lant barque shall brave - ly steer; But
brave, Than he who launch - es on the wave; A-
clear, Fare - well, once more to home so dear, For
'ere we part from Eng- land's shores to - night, A
- far he speeds in dis - tant climes to roam, With
when the tem - pest ra - ges loud and long, That
p
song we'll sing for home and beau - ty bright.
jo - cund song he rides the spark-ling foam.
home shall be our guid - ing star a - mong.
f
Then here's to the sail - or, and here's to the hearts so true, Who will think of him up-
f


ad lib.
- on the wa- ters blue, Sail - ing, sail - ing, o - ver the bounding
colla voce.
p
main, For ma- ny a storm - y wind shall blow 'ere Jack comes home a-
- gain; Sail - ing, sail - ing o - ver the bounding main, For
f
ad lib.
D.C.
ma - ny a storm - y wind shall blow 'ere Jack comes home a - gain.
colla voce.

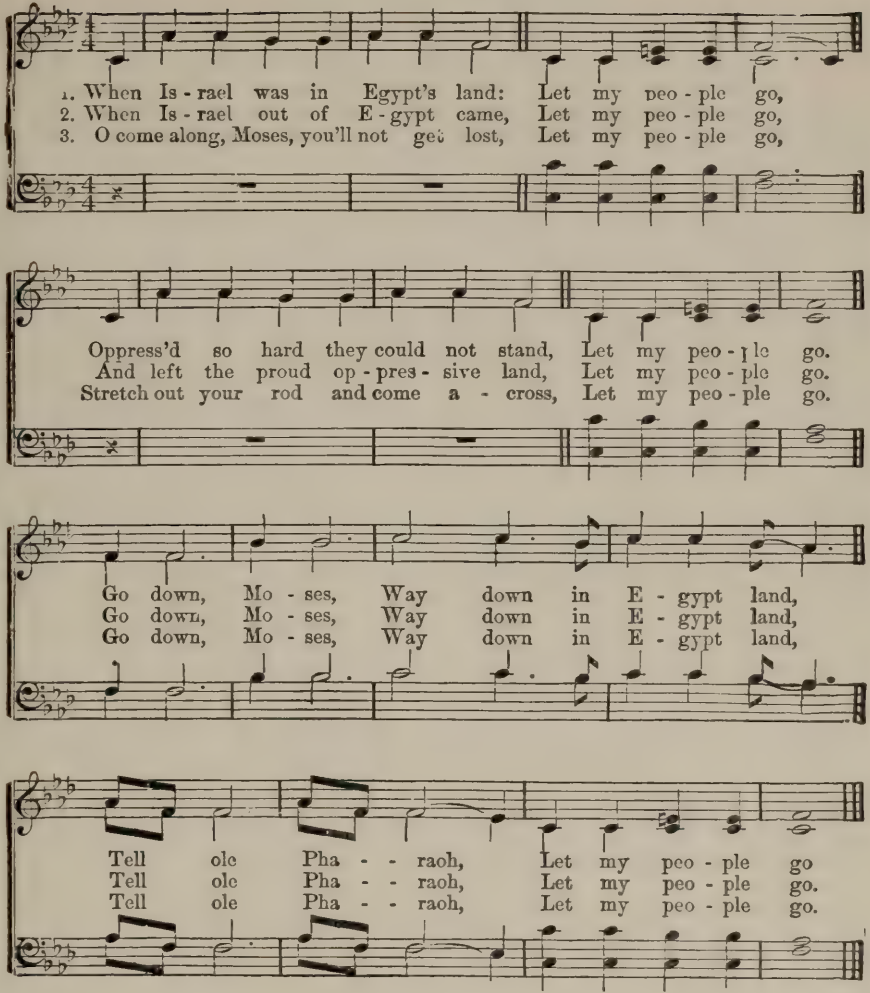
MARSEILLES HYMN.


Quartette.
f Soprano.
1. Ye sons of freedom wake to glory, Hark! hark! what myriads bid you rise, Your children,
f Alto.
f Tenor.
2. Oh, liberty! can man resign thee, Once having felt thy glorious flame? Can tyrants'
f Bass.
wives and grand-sires hoar - y, Behold their tears and hear their cries, Behold their
bolts and bars con - fine thee, And thus thy no - ble spir - it tame? And thus thy
tears and hear their cries, Shall lawless tyrants, mischief breeding, With hireling
no - ble spir - it tame? Too long our country wept, bewailing, The blood-stain'd


host, a ruf - fian band, Affright and des - o - late the land, While
sword our conquerors wield, But freedom is our sword and shield, And
peace and lib - er - ty lie bleeding. To arms, to arms, ye brave! The
all their arts are un - a - vail - ing. To arms, to arms, ye brave! The
pa - - triot sword unsheath! March on, march on,
pa - - triot sword unsheath! March on, march on,


all hearts resolved On lib - er - ty or death! March on, march
all hearts resolved On lib - er - ty or death! March on, march
on, all hearts resolved, On lib - - er - ty or
on, all hearts resolved, On lib - - er - ty or
death!
ff
death!

GO DOWN, MOSES.


1. When Is - rael was in Egypt's land: Let my peo - ple go,
2. When Is - rael out of E - gypt came, Let my peo - ple go,
3. O come along, Moses, you'll not get lost, Let my peo - ple go,
Oppress'd so hard they could not stand, Let my peo - ple go.
And left the proud op - pres - sive land, Let my peo - ple go.
Stretch out your rod and come a - cross, Let my peo - ple go.
Go down, Mo - ses, Way down in E - gypt land,
Go down, Mo - ses, Way down in E - gypt land,
Go down, Mo - ses, Way down in E - gypt land,
Tell ole Pha - - raoh, Let my peo - ple go
Tell ole Pha - - raoh, Let my peo - ple go.
Tell ole Pha - - raoh, Let my peo - ple go.

4.

As Israel stood by the water side,
Let my people go,
At the command of God it did divide,
Let my people go.
Go down, Moses, &c.

5.

Pharaoh said he would go across,
Let my people go,
But Pharaoh and his host were lost,
Let my people go.
Go down, Moses, &c.

6.

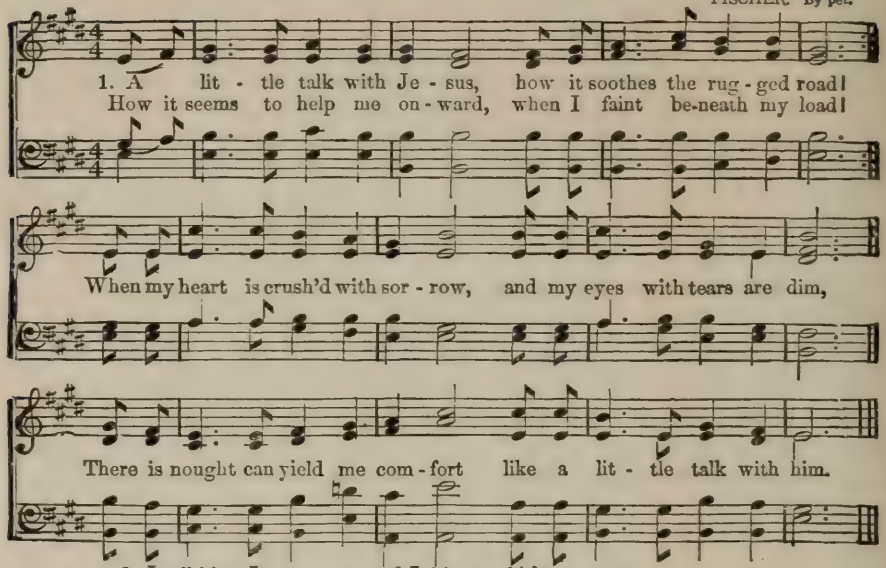
O bretheren, bretheren, you had better be [engaged,
Let my people go,
For the devil he's out on a big rampage,
Let my people go.
Go down, Moses, &c.

7.

O take your shoes from off yer feet,
Let my people go,
And walk into the golden street,
Let my people go.
Go down, Moses, &c.

A LITTLE TALK WITH JESUS.

FISCHER. By per.


1. A lit - tle talk with Je - sus, how it soothes the rug - ged road!
How it seems to help me on - ward, when I faint be-neath my load!
When my heart is crush'd with sor - row, and my eyes with tears are dim,
There is nought can yield me com - fort like a lit - tle talk with him.

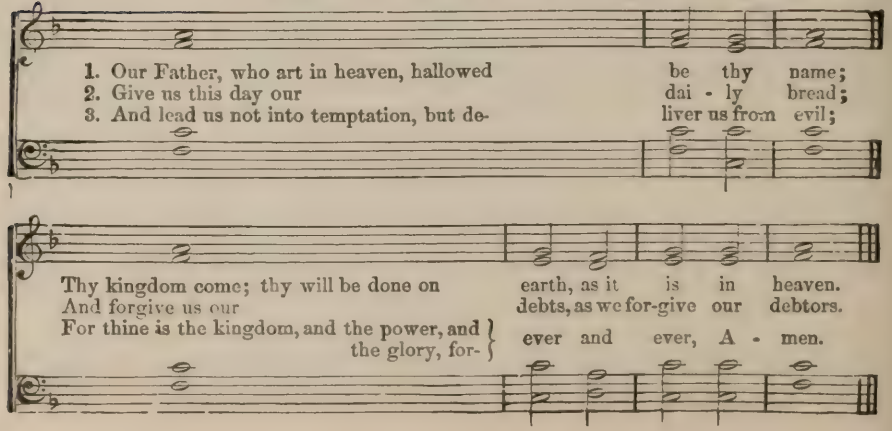
2. I tell him I am weary, and I fain would be at rest;
That I am daily, hourly longing to repose upon his breast;
And he answers me so sweetly, in the tenderest tones of love,
"I am coming soon to take thee to my happy home above.

3. The way is long and weary to yonder far-off clime,
But a little talk with Jesus doth while away the time.
The more I come to know him, and all his grace explore,
It sets me ever longing to know him more and more.

4. So I'll wait a little longer, 'till his appointed time,
And along the upward pathway my pilgrim feet shall climb.
There, in my Father's dwelling, where many mansions be,
I shall sweetly talk with Jesus, and he will talk with me.

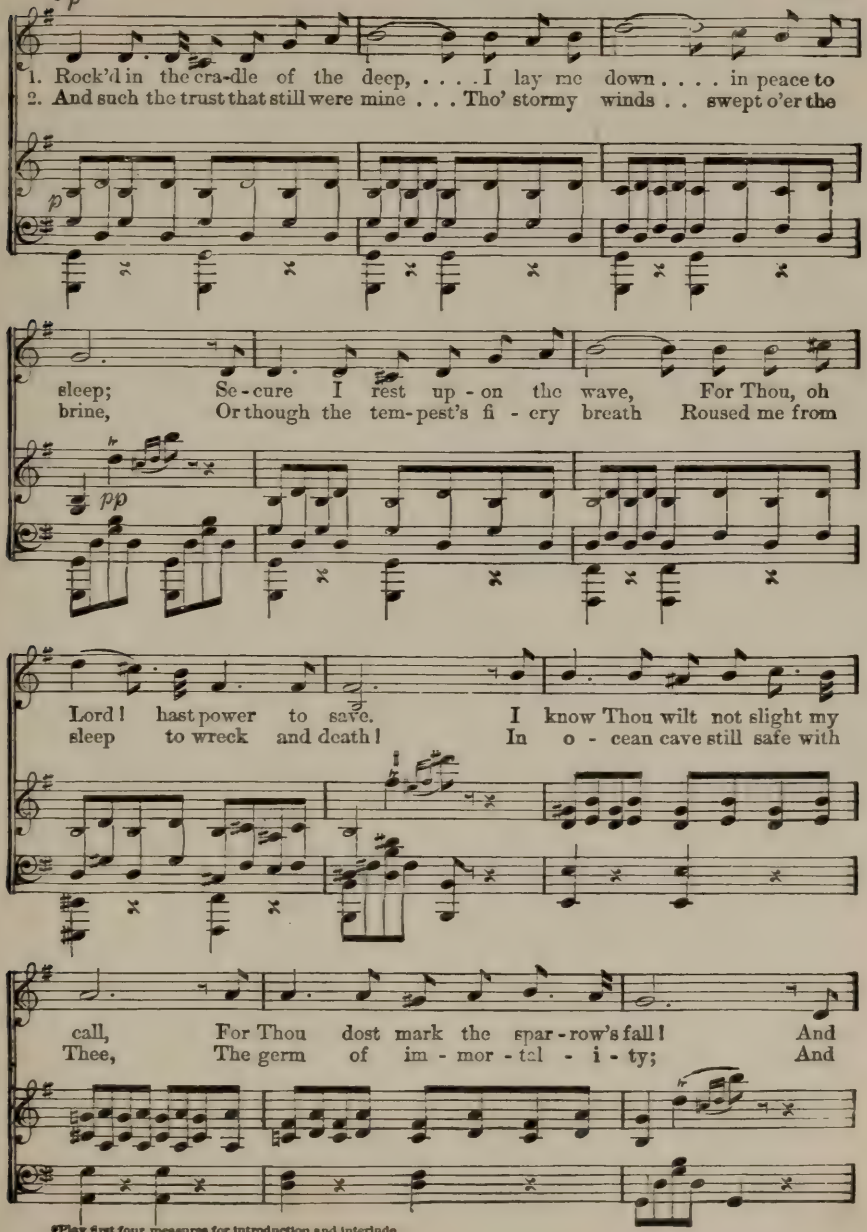
THE LORD'S PRAYER.

MARSHALL. By per.

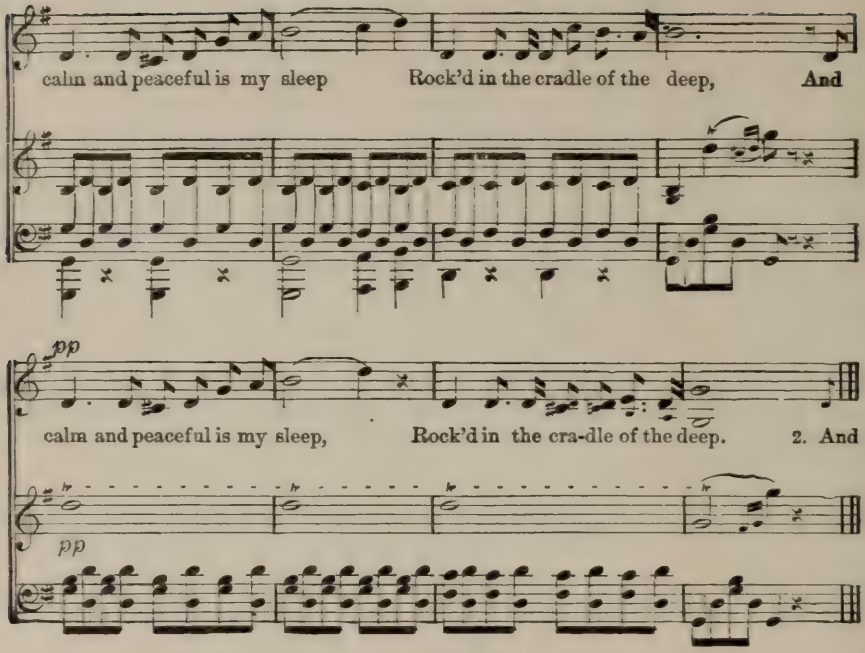

1. Our Father, who art in heaven, hallowed be thy name;
2. Give us this day our dai - ly bread;
3. And lead us not into temptation, but de- liver us from evil;
Thy kingdom come; thy will be done on earth, as it is in heaven.
And forgive us our debts, as we for-give our debtors.
For thine is the kingdom, and the power, and the glory, for- ever and ever, A - men.

ROCK'D IN THE CRADLE OF THE DEEP.

WILLARD. KNIGHT.

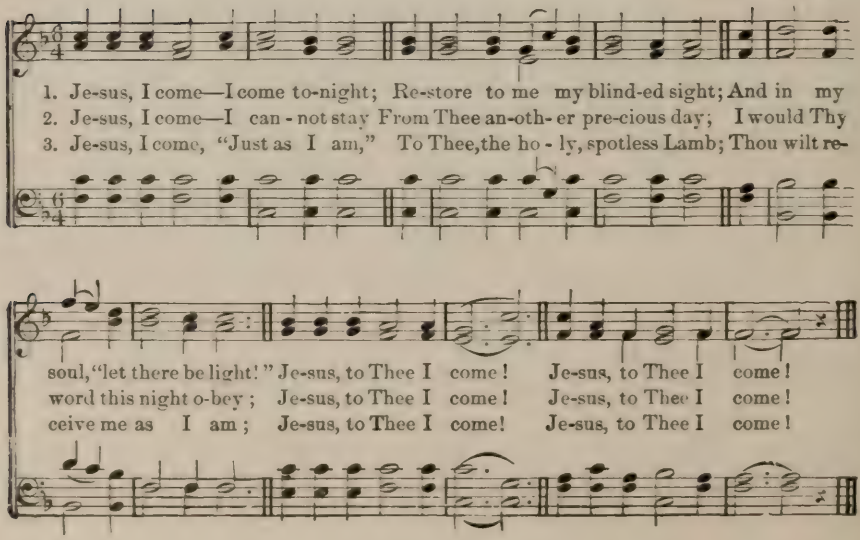

*p
1. Rock'd in the cra-dle of the deep, ... I lay me down . . . . in peace to
2. And such the trust that still were mine . . . Tho' stormy winds . . swept o'er the
p
sleep; Se-cure I rest up-on the wave, For Thou, oh
brine, Or though the tem-pest's fi-cry breath Roused me from
pp
Lord! hast power to save. I know Thou wilt not slight my
sleep to wreck and death! In o-cean cave still safe with
call, For Thou dost mark the spar-row's fall! And
Thee, The germ of im-mor-tal-i-ty; And

*Play first four measures for introduction and interlude.


calm and peaceful is my sleep Rock'd in the cradle of the deep, And
pp
calm and peaceful is my sleep, Rock'd in the cra-dle of the deep. 2. And
pp

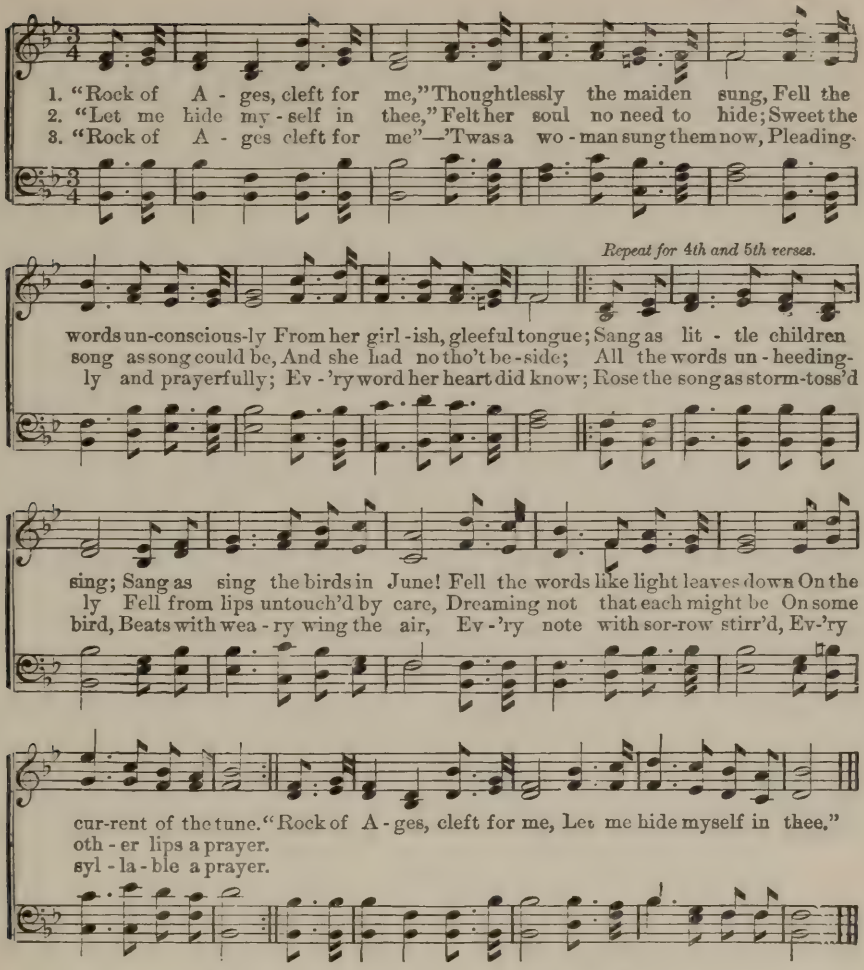
JESUS, TO THEE I COME.

GOULD.


1. Je-sus, I come—I come to-night; Re-store to me my blind-ed sight; And in my
2. Je-sus, I come—I can-not stay From Thee an-oth-er pre-cious day; I would Thy
3. Je-sus, I come, "Just as I am," To Thee, the ho-ly, spotless Lamb; Thou wilt re-
soul, "let there be light!" Je-sus, to Thee I come! Je-sus, to Thee I come!
word this night o-bey; Je-sus, to Thee I come! Je-sus, to Thee I come!
ceive me as I am; Je-sus, to Thee I come! Je-sus, to Thee I come!

CLEFT FOR ME.

BRUCE. By per.


1. "Rock of A - ges, cleft for me," Thoughtlessly the maiden sung, Fell the
2. "Let me hide my - self in thee," Felt her soul no need to hide; Sweet the
3. "Rock of A - ges cleft for me"—'Twas a wo - man sung them now, Pleading.
Repeat for 4th and 5th verses.
words un-conscious-ly From her girl - ish, gleeful tongue; Sang as lit - tle children
song as song could be, And she had no tho't be - side; All the words un - heeding-
ly and prayerfully; Ev - 'ry word her heart did know; Rose the song as storm-toss'd
sing; Sang as sing the birds in June! Fell the words like light leaves down On the
ly Fell from lips untouch'd by care, Dreaming not that each might be On some
bird, Beats with wea - ry wing the air, Ev - 'ry note with sor-row stirr'd, Ev-'ry
cur-rent of the tune. "Rock of A - ges, cleft for me, Let me hide myself in thee."
oth - er lips a prayer.
syl - la - ble a prayer.

4.

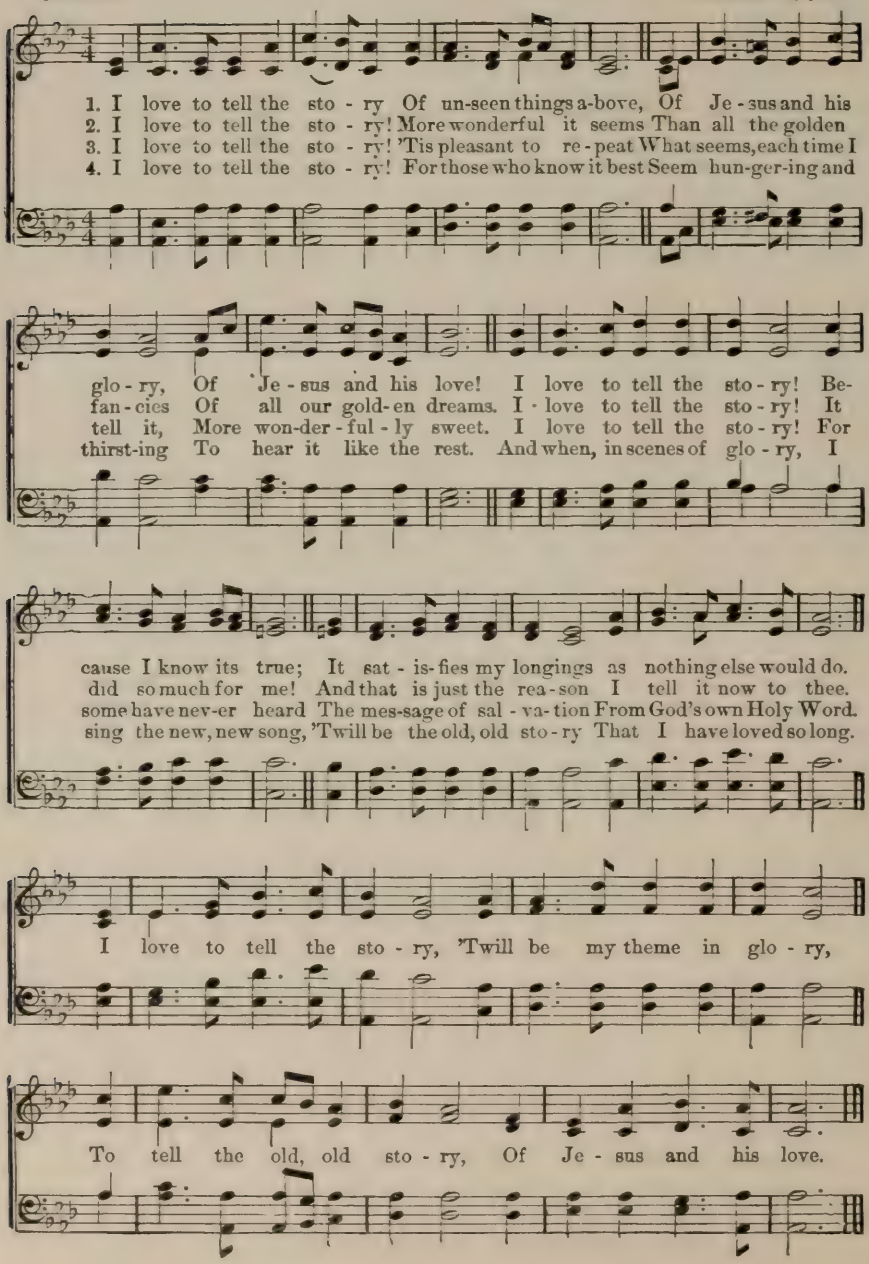
"Rock of Ages, Cleft for me,"
Lips grown aged sung the hymn
Trustingly and tenderly,
Voice grown weak, and eyes grown dim.
"Let me hide myself in thee,"
Trembling though the voice, and low,
Ran the sweet strain peacefully,
Like a river in its flow.
Sung as only they can sing,
Who life's thorny paths have pressed;
Sung as only they can sing,
Who behold the promised rest—
"Rock of Ages, cleft for me,
Let me hide myself in thee."

5.

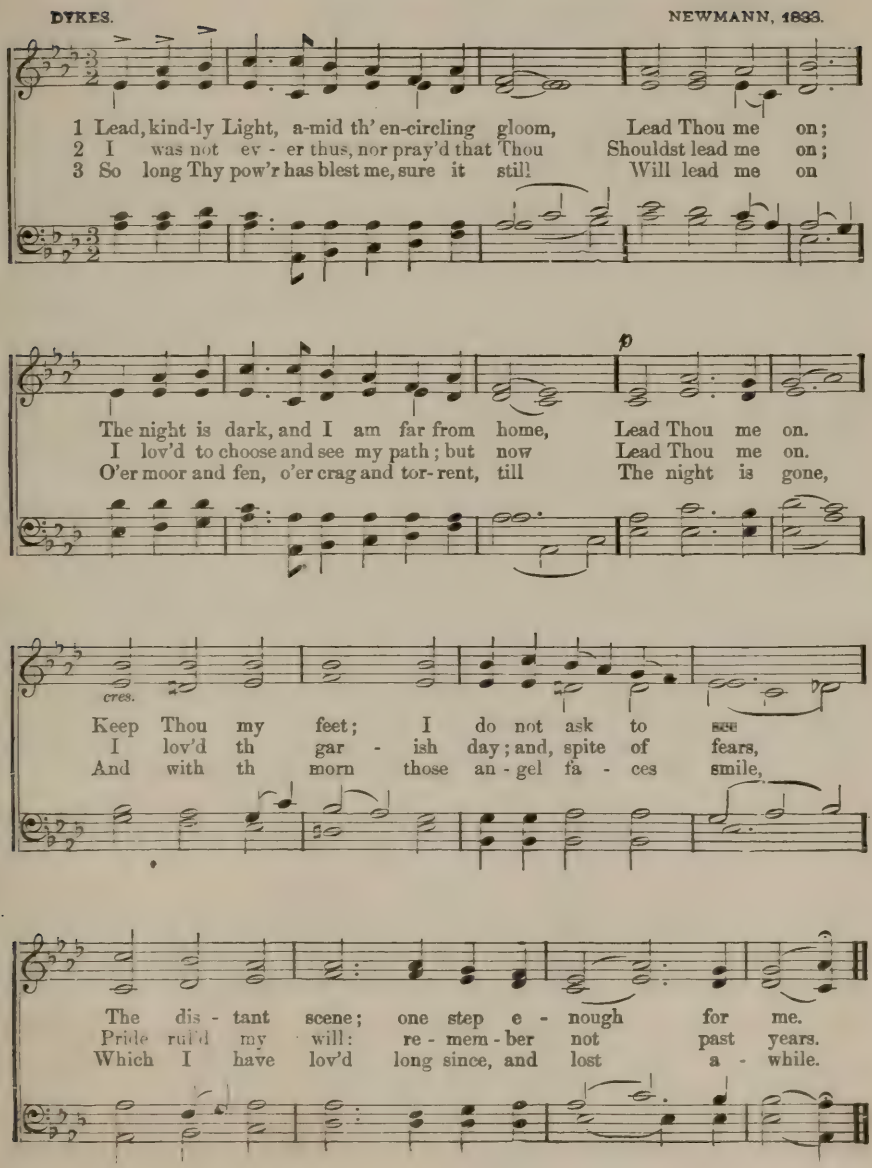
"Rock of Ages, cleft for me,"
Sung above the coffin-lid;
Underneath, all restfully,
All life's joys and sorrows hid,
Nevermore, O storm tossed soul!
Nevermore from wind or tide,
Nevermore from billow's roll,
Wilt thou need thyself to hide.
Could the sightless, sunken eyes,
Closed beneath the soft gray hair,
Could the mute and stiffened lips
Move again in pleading prayer,
Still, aye, still the words would be,
"Let me hide myself in thee."

I LOVE TO TELL THE STORY.

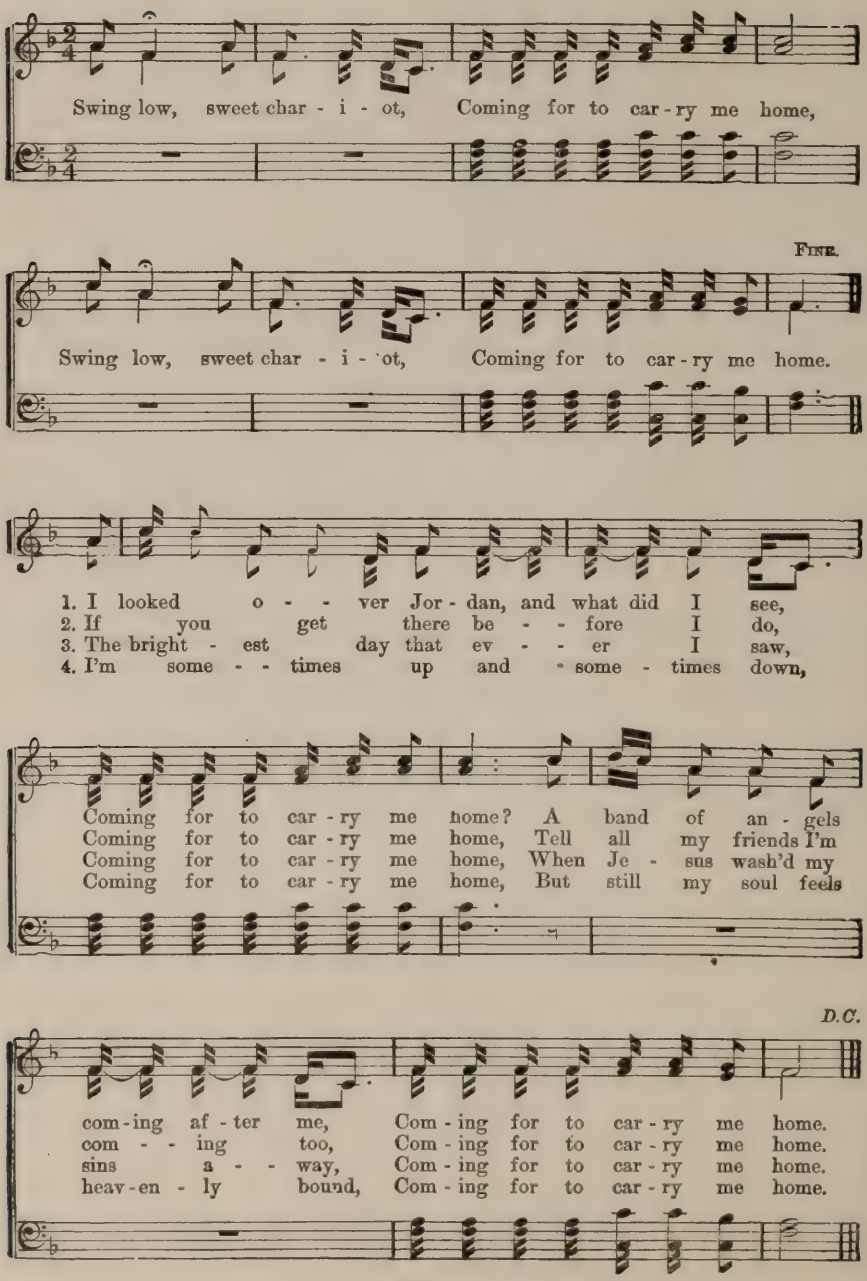
HANKEY. FISCHER. By per.


1. I love to tell the sto - ry Of un-seen things a-bove, Of Je - sus and his glo - ry, Of Je - sus and his love! I love to tell the sto - ry! Be-
2. I love to tell the sto - ry! More wonderful it seems Than all the golden fan - cies Of all our gold-en dreams. I love to tell the sto - ry! It did so much for me! And that is just the rea - son I tell it now to thee.
3. I love to tell the sto - ry! 'Tis pleasant to re - peat What seems, each time I tell it, More won-der - ful - ly sweet. I love to tell the sto - ry! For some have nev-er heard The mes-sage of sal - va - tion From God's own Holy Word.
4. I love to tell the sto - ry! For those who know it best Seem hun-ger-ing and thirst-ing To hear it like the rest. And when, in scenes of glo - ry, I sing the new, new song, 'Twill be the old, old sto - ry That I have loved so long.
cause I know its true; It sat - is-fies my longings as nothing else would do.
I love to tell the sto - ry, 'Twill be my theme in glo - ry,
To tell the old, old sto - ry, Of Je - sus and his love.

LEAD, KINDLY LIGHT.

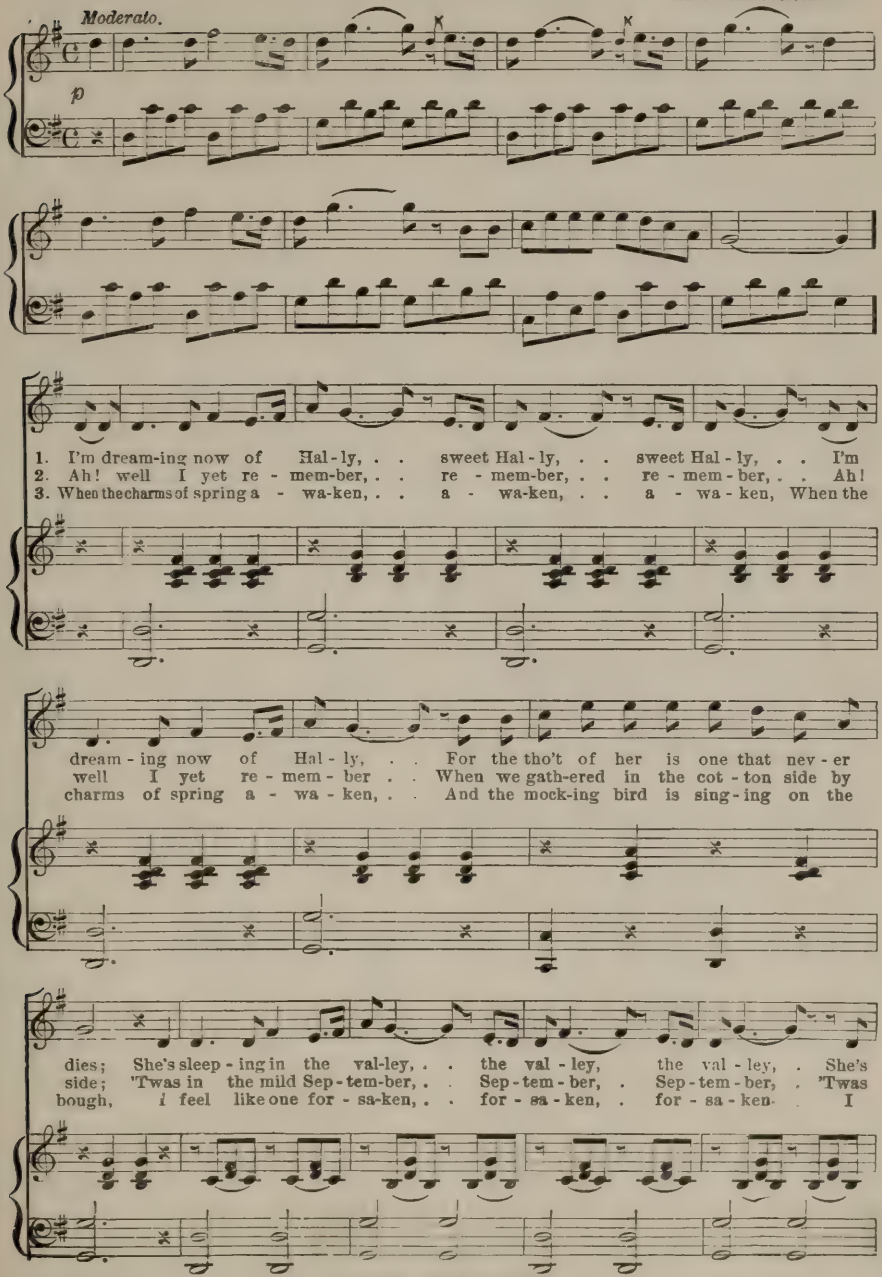

DYKES.
NEWMANN, 1833.
1 Lead, kind-ly Light, a-mid th' en-circling gloom, Lead Thou me on;
2 I was not ev - er thus, nor pray'd that Thou Shouldst lead me on;
3 So long Thy pow'r has blest me, sure it still Will lead me on
The night is dark, and I am far from home, Lead Thou me on.
I lov'd to choose and see my path; but now Lead Thou me on.
O'er moor and fen, o'er crag and tor-rent, till The night is gone,
cres.
Keep Thou my feet; I do not ask to see
I lov'd th gar - ish day; and, spite of fears,
And with th morn those an - gel fa - ces smile,
The dis - tant scene; one step e - nough for me.
Pride rul'd my will: re - mem - ber not past years.
Which I have lov'd long since, and lost a - while.

SWING LOW SWEET CHARIOT.


Swing low, sweet char - i - ot, Coming for to car - ry me home,
FINE.
Swing low, sweet char - i - ot, Coming for to car - ry me home.
1. I looked o - - ver Jor - dan, and what did I see,
2. If you get there be - - fore I do,
3. The bright - est day that ev - - er I saw,
4. I'm some - - times up and some - times down,
Coming for to car - ry me home? A band of an - gels
Coming for to car - ry me home, Tell all my friends I'm
Coming for to car - ry me home, When Je - sus wash'd my
Coming for to car - ry me home, But still my soul feels
D.C.
com - ing af - ter me, Com - ing for to car - ry me home.
com - - ing too, Com - ing for to car - ry me home.
sins a - - way, Com - ing for to car - ry me home.
heav - en - ly bound, Com - ing for to car - ry me home.

LISTEN TO THE MOCKING BIRD.

ALICE HAWTHORNE.


Moderato.
p
1. I'm dream-ing now of Hal-ly, . . sweet Hal-ly, . . sweet Hal-ly, . . I'm
2. Ah! well I yet re-mem-ber, . . re-mem-ber, . . re-mem-ber, . . Ah!
3. When the charms of spring a-wa-ken, . . a-wa-ken, . . a-wa-ken, When the
dream-ing now of Hal-ly, . . For the tho't of her is one that nev-er
well I yet re-mem-ber . . When we gath-ered in the cot-ton side by
charms of spring a-wa-ken, . . And the mock-ing bird is sing-ing on the
dies; She's sleep-ing in the val-ley, . . the val-ley, the val-ley, . She's
side; 'Twas in the mild Sep-tem-ber, . . Sep-tem-ber, Sep-tem-ber, 'Twas
bough, I feel like one for-sa-ken, . . for-sa-ken, for-sa-ken- I

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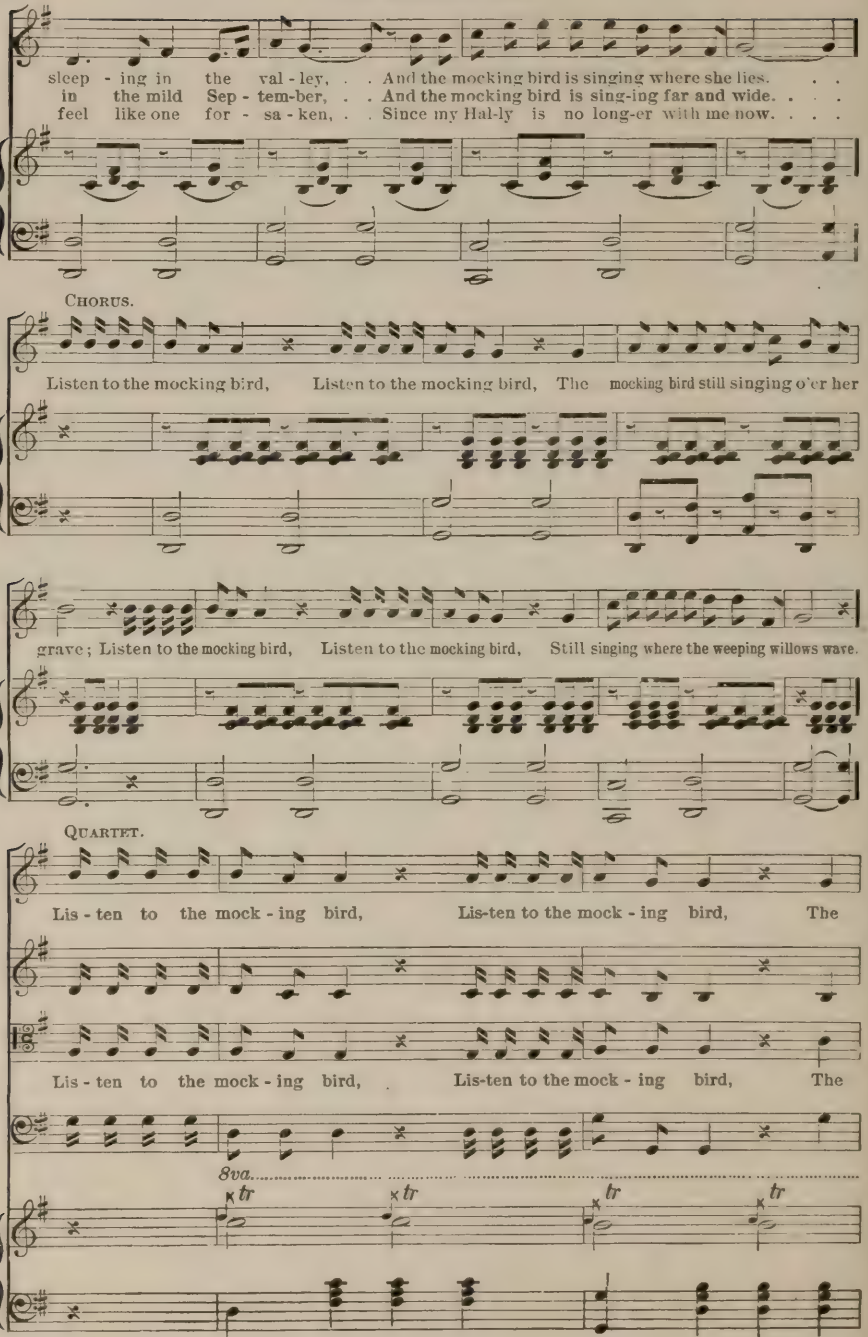
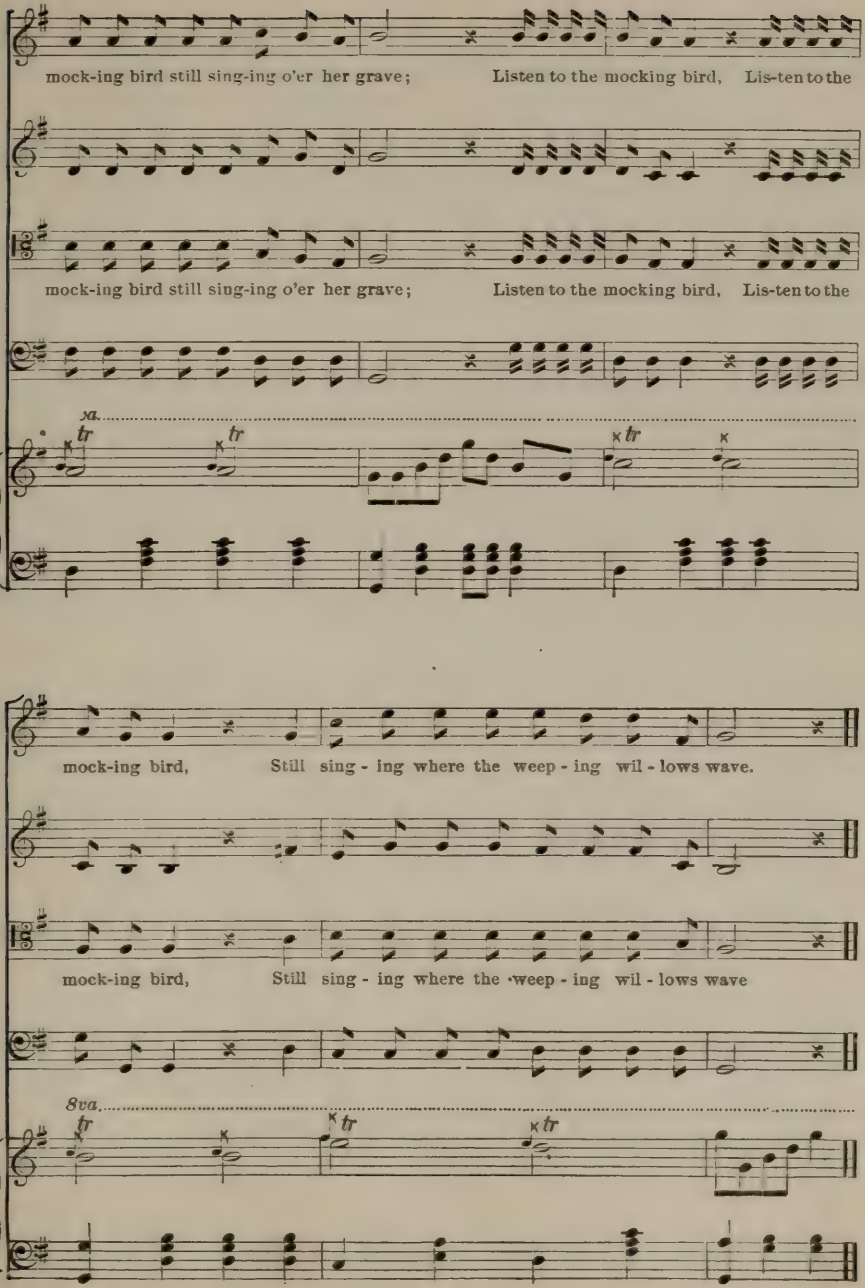

sleep - ing in the val - ley, . . And the mocking bird is singing where she lies. . . .
in the mild Sep - tem-ber, . . And the mocking bird is sing-ing far and wide. . . .
feel like one for - sa - ken, . . Since my Hal-ly is no long-er with me now. . . .
Chorus.
Listen to the mocking bird, Listen to the mocking bird, The mocking bird still singing o'er her
grave; Listen to the mocking bird, Listen to the mocking bird, Still singing where the weeping willows wave.
Quartet.
Lis - ten to the mock - ing bird, Lis-ten to the mock - ing bird, The
Lis - ten to the mock - ing bird, Lis-ten to the mock - ing bird, The
8va.
tr
tr
tr
tr


mock-ing bird still sing-ing o'er her grave; Listen to the mocking bird, Lis-ten to the
mock-ing bird still sing-ing o'er her grave; Listen to the mocking bird, Lis-ten to the
8va.
mock-ing bird, Still sing - ing where the weep - ing wil - lows wave.
mock-ing bird, Still sing - ing where the ·weep - ing wil - lows wave
8va.

BONNIE DOON.

BURNS. *Andante.* MILLER.

1. Ye banks and braes o' bonnie Doon, How can ye bloom sae fresh and fair? How
2. Oft hae I rov'd by bonnie Doon, To see the rose and woodbine twine; When

p

can ye chaunt, ye lit - tle birds, And I sae wea - ry, fu' of care? Thou'lt
il - ka bird sang o' its love, And fond-ly sae did I o' mine.' Wi'

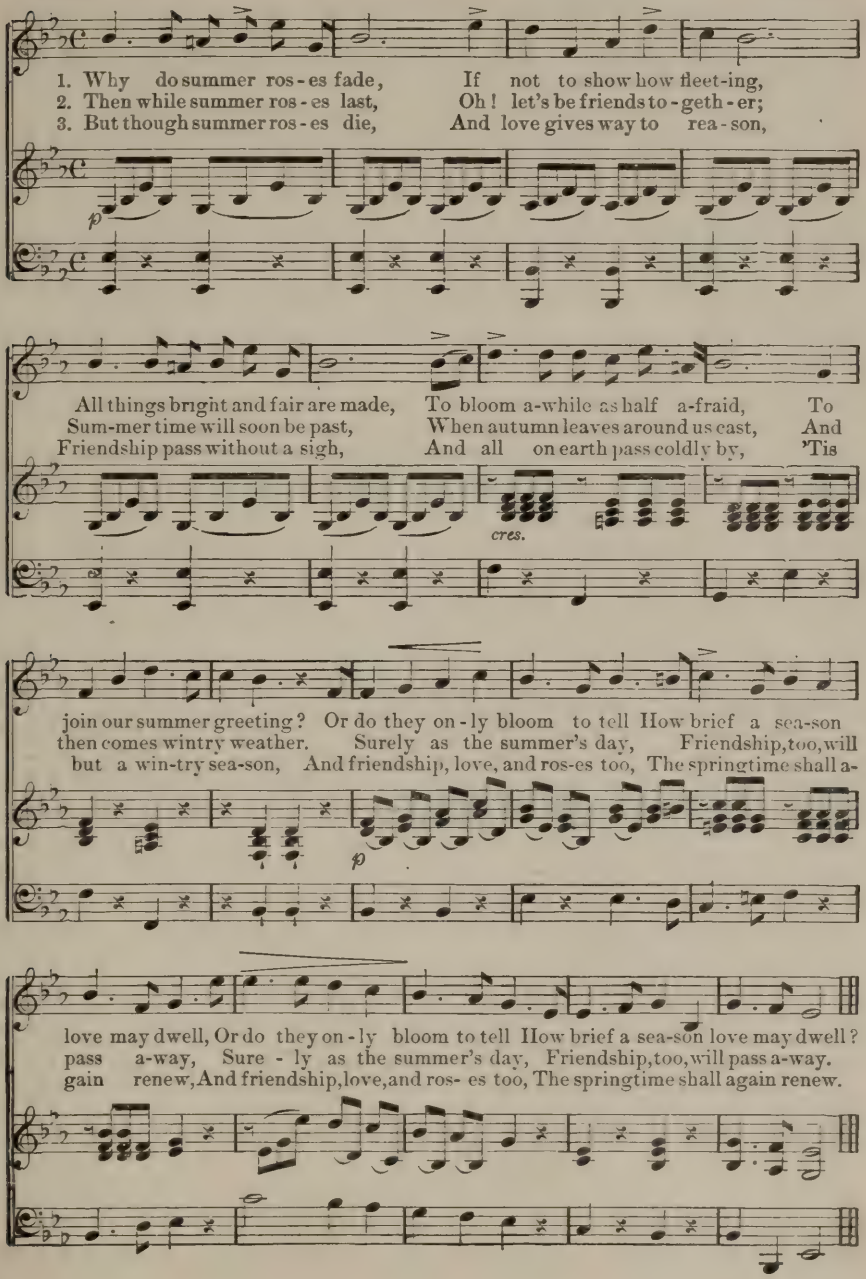
break my heart, thou warbling bird, That wantons thro' the flow'ry thorn, Thou
lightsome heart I pu'd a rose, Fu' sweet up-on its thorn - y tree; But

mf *p dolce.*

mindst me o' de - part - ed joys, De - part-ed nev - er to re-turn.
my fause lov - er stole my rose, And, ah! he left the thorn wi' me.

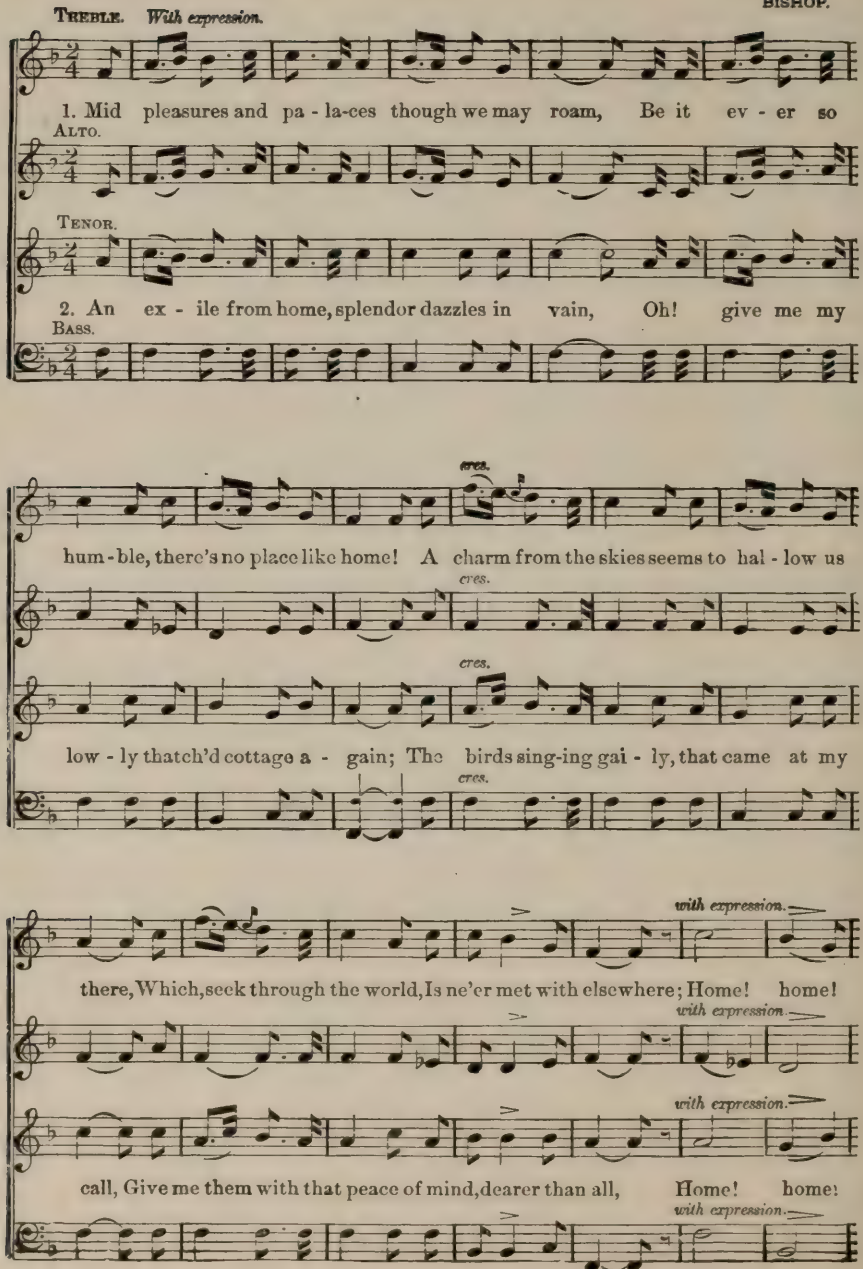
WHY DO SUMMER ROSES FADE.

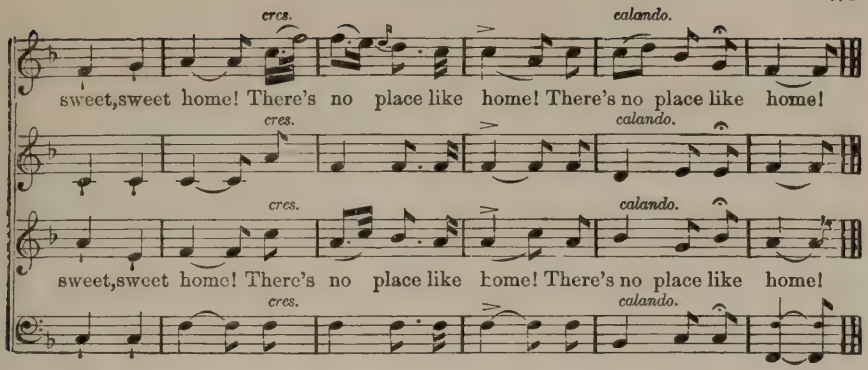
CARPENTER. BARKER.


1. Why do summer ros - es fade, If not to show how fleet-ing,
2. Then while summer ros - es last, Oh! let's be friends to - geth - er;
3. But though summer ros - es die, And love gives way to rea - son,
p
All things bright and fair are made, To bloom a-while as half a-fraid, To
Sum-mer time will soon be past, When autumn leaves around us cast, And
Friendship pass without a sigh, And all on earth pass coldly by, 'Tis
cres.
join our summer greeting? Or do they on - ly bloom to tell How brief a sea-son
then comes wintry weather. Surely as the summer's day, Friendship, too, will
but a win-try sea-son, And friendship, love, and ros-es too, The springtime shall a-
p
love may dwell, Or do they on - ly bloom to tell How brief a sea-son love may dwell?
pass a-way, Sure - ly as the summer's day, Friendship, too, will pass a-way.
gain renew, And friendship, love, and ros- es too, The springtime shall again renew.

HOME, SWEET HOME.

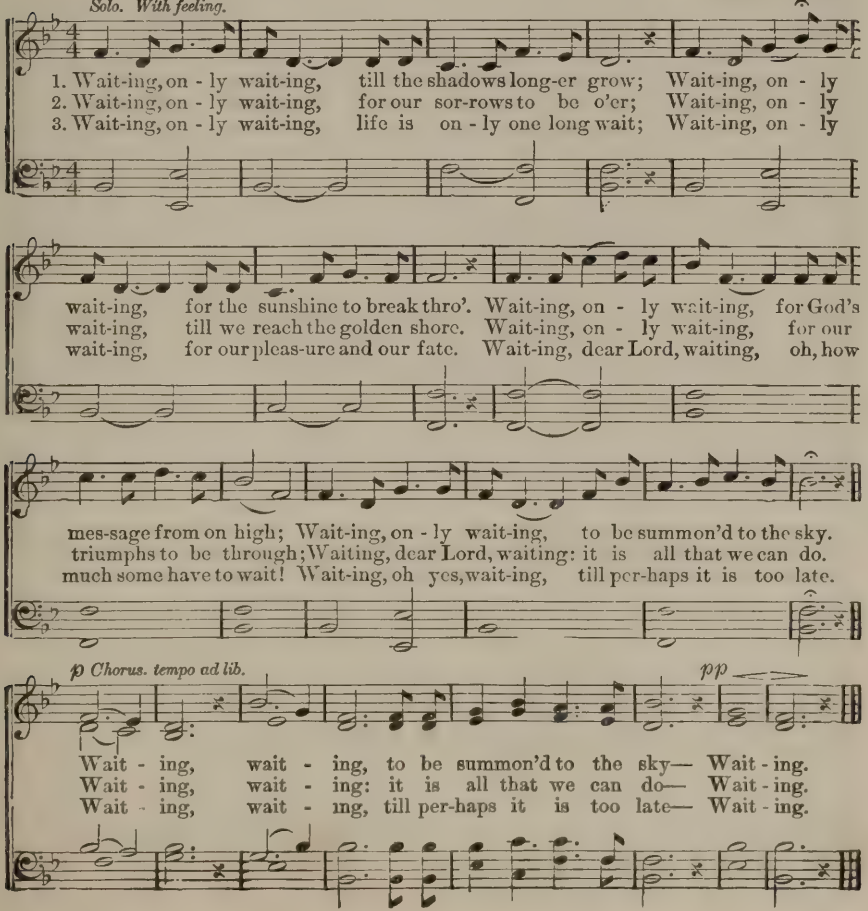
BISHOP.


TREBLE. With expression.
1. Mid pleasures and pa - la-ces though we may roam, Be it ev - er so
ALTO.
TENOR.
2. An ex - ile from home, splendor dazzles in vain, Oh! give me my
BASS.
cres.
hum - ble, there's no place like home! A charm from the skies seems to hal - low us
low - ly thatch'd cottage a - gain; The birds sing-ing gai - ly, that came at my
with expression.
there, Which, seek through the world, Is ne'er met with elsewhere; Home! home!
call, Give me them with that peace of mind, dearer than all, Home! home!



WAITING, ONLY WAITING.

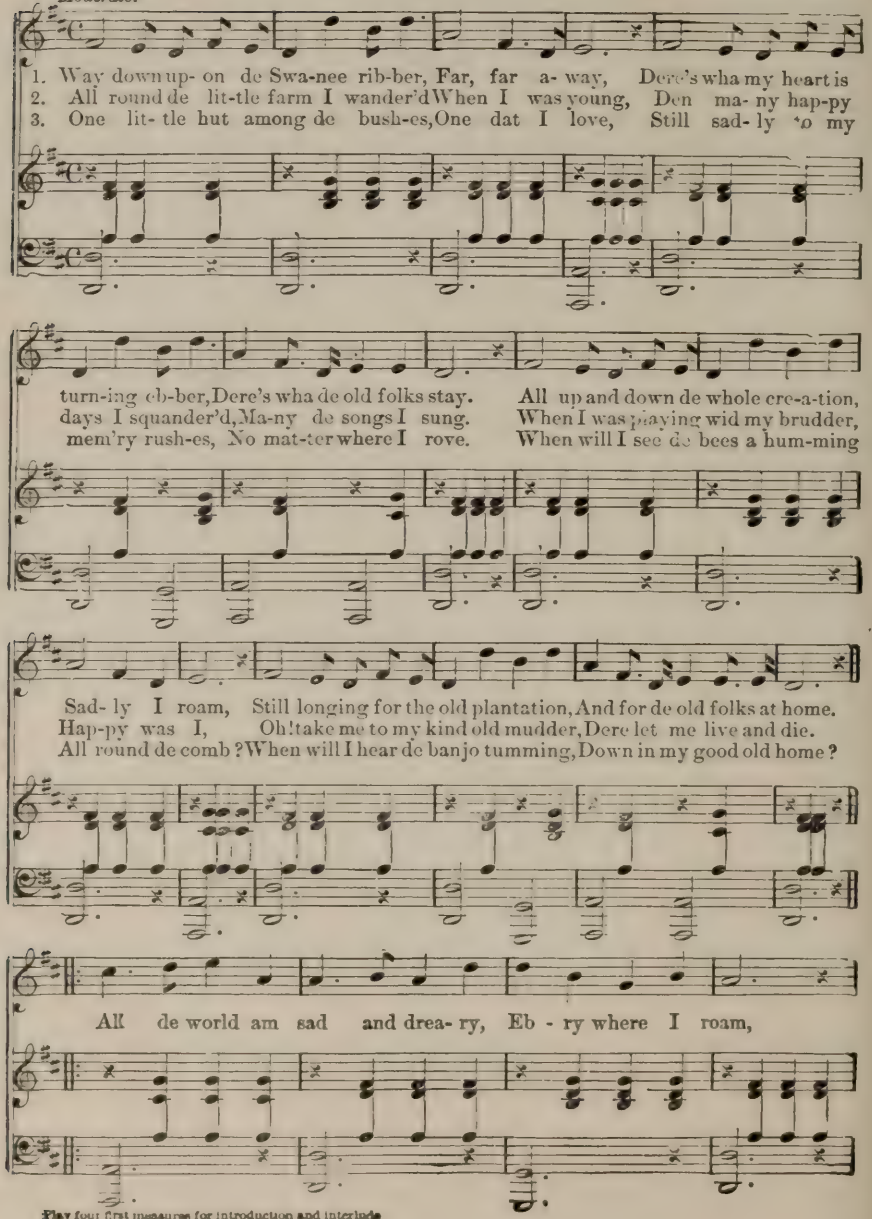
A. L. C. PERKINS. By per.


Solo. With feeling.
1. Wait-ing, on - ly wait-ing, till the shadows long-er grow; Wait-ing, on - ly
2. Wait-ing, on - ly wait-ing, for our sor-rows to be o'er; Wait-ing, on - ly
3. Wait-ing, on - ly wait-ing, life is on - ly one long wait; Wait-ing, on - ly
wait-ing, for the sunshine to break thro'. Wait-ing, on - ly wait-ing, for God's
wait-ing, till we reach the golden shore. Wait-ing, on - ly wait-ing, for our
wait-ing, for our pleas-ure and our fate. Wait-ing, dear Lord, waiting, oh, how
mes-sage from on high; Wait-ing, on - ly wait-ing, to be summon'd to the sky.
triumphs to be through; Waiting, dear Lord, waiting: it is all that we can do.
much some have to wait! Wait-ing, oh yes, wait-ing, till per-haps it is too late.
p Chorus. tempo ad lib.
pp
Wait - ing, wait - ing, to be summon'd to the sky— Wait - ing.
Wait - ing, wait - ing: it is all that we can do— Wait - ing.
Wait - ing, wait - ing, till per-haps it is too late— Wait - ing.

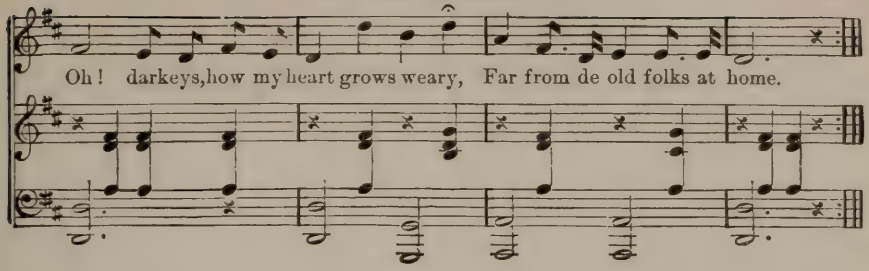
OLD FOLKS AT HOME.*

FOSTER. FOSTER. By per

Moderato.

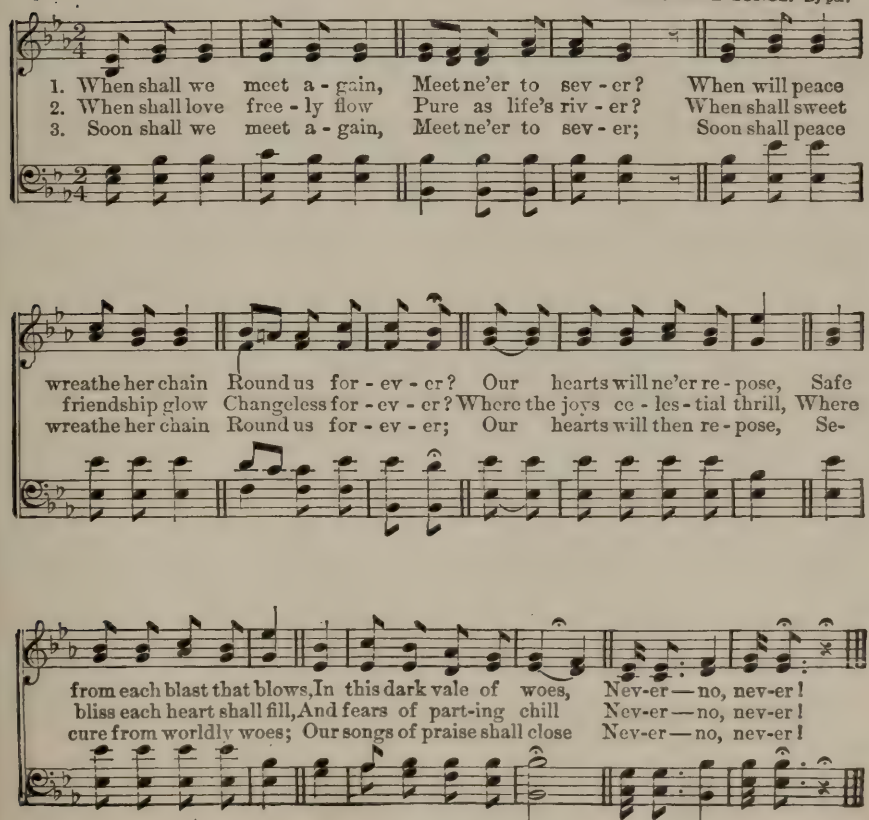

1. Way down up- on de Swa-nee rib-ber, Far, far a- way, Dere's wha my heart is
2. All round de lit-tle farm I wander'd When I was young, Den ma- ny hap-py
3. One lit- tle hut among de bush-es, One dat I love, Still sad- ly to my
turn-ing ob-ber, Dere's wha de old folks stay. All up and down de whole cre-a-tion,
days I squander'd, Ma-ny de songs I sung. When I was playing wid my brudder,
mem'ry rush-es, No mat-ter where I rove. When will I see de bees a hum-ming
Sad- ly I roam, Still longing for the old plantation, And for de old folks at home.
Hap-py was I, Oh! take me to my kind old mudder, Dere let me live and die.
All round de comb? When will I hear de banjo tumming, Down in my good old home?
All de world am sad and drea- ry, Eb - ry where I roam,

*Play four first measures for introduction and interlude



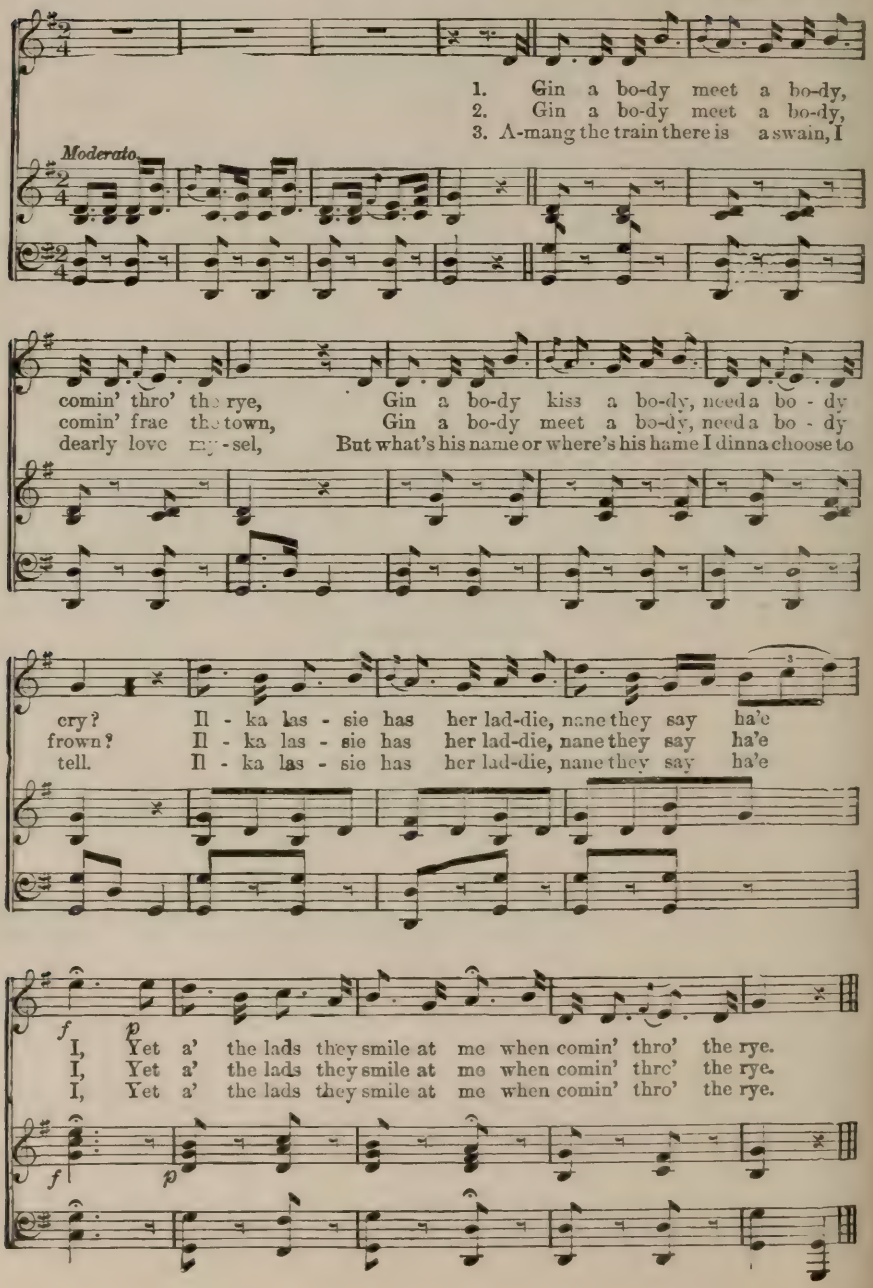
WHEN SHALL WE MEET AGAIN.

SPIRITUAL SONGS. By per.

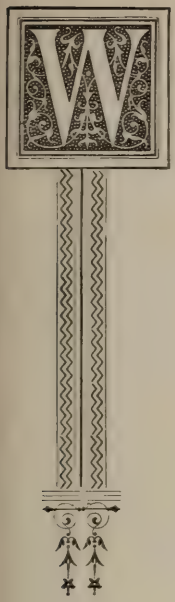

1. When shall we meet a - gain, Meet ne'er to sev - er? When will peace
2. When shall love free - ly flow Pure as life's riv - er? When shall sweet
3. Soon shall we meet a - gain, Meet ne'er to sev - er; Soon shall peace
wreathe her chain Round us for - ev - er? Our hearts will ne'er re - pose, Safe
friendship glow Changeless for - ev - er? Where the joys ce - les - tial thrill, Where
wreathe her chain Round us for - ev - er; Our hearts will then re - pose, Se-
from each blast that blows,In this dark vale of woes, Nev-er — no, nev-er!
bliss each heart shall fill,And fears of part-ing chill Nev-er — no, nev-er!
cure from worldly woes; Our songs of praise shall close Nev-er — no, nev-er!

COMIN' THRO' THE RYE.

SCOTCH SONG.


1. Gin a bo-dy meet a bo-dy,
2. Gin a bo-dy meet a bo-dy,
3. A-mang the train there is a swain, I
Moderato.
comin' thro' the rye, Gin a bo-dy kiss a bo-dy, need a bo - dy
comin' frae the town, Gin a bo-dy meet a bo-dy, need a bo - dy
dearly love my - sel, But what's his name or where's his hame I dinna choose to
cry? Il - ka las - sie has her lad-die, nane they say ha'e
frown? Il - ka las - sie has her lad-die, nane they say ha'e
tell. Il - ka las - sie has her lad-die, nane they say ha'e
f p
I, Yet a' the lads they smile at me when comin' thro' the rye.
I, Yet a' the lads they smile at me when comin' thro' the rye.
I, Yet a' the lads they smile at me when comin' thro' the rye.
f p

BOOK VIII



WONDERFUL AND REMARKABLE THINGS AND FACTS

CAREFULLY CLASSIFIED AND ARRANGED

Striking Facts About the World's Religions
Interesting Facts About Books and Authors
Wonderful Truths About the Human Family
Remarkable Historical Facts, Places and Events
Some Wonderful Things in Nature
Wonderful Works of Man
Marvelous Facts About Small Living Creatures
Curious Facts About Wood and Trees

WONDERFUL AND REMARKABLE THINGS AND FACTS.

THE world is full of wonderful and remarkable things and facts and we are all curious enough to want to look into them. They are instructive. They stimulate the imagination and create a genuine thirst for knowledge. With a view to instructing and pleasing the reader, the following compendium of wonderful and remarkable things and facts has been carefully brought together, classified and grouped with extreme care and patience.

The Seven Bibles of the World.

The chief sacred books of the world are the Scriptures of the Christians, the Tripitaka of the Southern Buddhists, the Five Kings of the Chinese, the three Vedas of the Hindoos, the Koran of the Mohammedans, the Zendavesta of the Parsees, and the Eddas of the Scandinavians.

The Koran is the most recent, having been written in the seventh century after Christ. It contains many excerpts from the Old and New Testaments and the Talmud.

The Tripitaka contains sublime morals and pure aspirations. The author lived and died in the sixth century before Christ.

The Five Kings contain wise sayings on the duties of life. The word "King" in the Chinese language means web of cloth. From this it is presumed that they were originally written on five rolls of cloth. They were written by a number of wise men some time not earlier than the eleventh century before Christ.

The Vedas can not be proven to antedate the twelfth century before the Christian era.

The Zendavesta is regarded among scholars as being the greatest and most learned of all sacred writings, excepting the Christian Bible. It was written by Zoroaster in the twelfth century before Christ.

The Eddas, a semi-sacred work of the Scandinavians, was first given to the world in the fourteenth century but is probably much older.

Moses is claimed to have written the Pentateuch at least 1,500 years before Christ; if so, that portion of the Christian Bible is at least 300 years older than any other sacred writings.

The Nine Religions of the World.

There are estimated to be 1,000 forms of religious worship practiced in the world. The following table shows the nine grand divisions or creeds, which are each subdivided into numerous sects:

	Creeds.	No. of Followers.
1.	Christianity	500,000,000
2.	Worship of Ancestors and Confucianism	256,000,000
3.	Hinduism	190,000,000
4.	Mohammedanism	180,000,000
5.	Buddhism	147,900,000
6.	Taoism	43,000,000
7.	Shintoism	14,000,000
8.	Judaism	8,000,000
9.	Polytheism	117,681,669

Distribution of the People of the Christian Religion.

The leading faiths are represented by these figures: Protestant Christians, 200,000,000; Roman Catholic Christians, 195,000,000; Greek Catholic Christians, 105,000,000; non-Christians, 1,000,000,000.

The Name of God in Forty-Eight Languages.

Hebrew	Eleah, Jehovah
Chaldaic	Eiliah
Assyrian	Eleah
Syrian and Turkish	Alah
Malay	Alla
Arabic	Allah
Languages of the Magi	Orsi
Old Egyptian	Teut
Armenian	Teuti
Modern Egyptian	Teun
Greek	Theos
Cretan	Thios
Aedian and Dorian	Ilos
Latin	Deus
Low Latin	Diex
Celtic Gaelic	Diu
French	Dieu
Spanish	Dios
Portuguese	Deos
Old German	Diet
Provincial	Dion
Low Breton	Done
Italian	Dio
Irish	Dia
Olotu tongue	Deu
German and Swiss	Gott
Flemish	God
Dutch	God
English	God
Teutonic	Goth
Danish and Swedish	Gud
Norwegian	Gud
Slav	Buch
Polish	Bog
Polacca	Bung
Lapp	Jubinal
Finnish	Jumala
Runic	As
Zemblian	Fetiza
Pannonian	Istu
Hindostanee	Rain
Coromandel	Brama
Tartar	Magatai
Persian	Sire
Chinese	Prussa
Japanese	Goezer
Madagascar	Zannar
Peruvian	Puchecammae

Mankind Naturally Religious.

All men, wherever found, worship some higher power. Among the most savage races there exists some conception of a deity. Beginning with Fetishism—the worship of animals, trees, insects, etc.—the religious ideas advanced into personification and symbolism, and produced Idolatry or Paganism, and was an element of early civilization. From this, in different lands, and among different races of men, diverged notions of religious theology, which eventually worked themselves into systems, generally based upon a personality, or individual Godhead or mediator. The chief religions of the world are the Jewish, the Christian, the Mohammedan, the Brahman, the Buddhistic and the Zoroastrian. Buddhism has the most followers and Christianity next. Brahmanism and Mohammedanism each have a little more than one-fourth as many as Christianity. The Jewish religion comes next, and the Zoroastrians or Fire-worshippers the smallest number. It is not possible to attempt to do more than outline the different faiths.

The Jewish Religion is the oldest of all organized forms of worship. And the teachers of its tenets have influenced the Jewish people, keeping their stock pure and unmixed though they are scattered in all countries.

In their religious observances modern Jews adhere to the rules of the Mosaic dispensation. Their service consists chiefly in reading the law in their synagogues, together with a variety of prayers. They abstain from the meats prohibited by the Levitical law, and they continue to observe the ceremonies of the Passover, as nearly as possible. They offer prayers for the dead, because they believe that the souls of the wicked go to a place of temporary punishment, where they remain under trial a year, and they think that very few will be condemned to suffer eternally. We give a summary of the confession of faith, in which all orthodox Jews must live and die. It is made up of thirteen articles, and was drawn up in the eleventh century by a celebrated rabbi named Maimonides. These articles declare in substance: (1) That there is one God,

creator of all things, who may exist without any part of the universe, but without whom nothing can maintain existence; (2) that God is uncompounded and indivisible, but different from all other unities; (3) that God is an immaterial being, without any admixture of corporeal substance; (4) that God is eternal, but everything else had a beginning in time; (5) that God alone ought to be worshipped, without mediators or intercessors; (6) that there have been inspired prophets, and may be more; (7) that Moses was the grandest prophet that ever appeared; (8) that the law of Moses was in every syllable dictated by the Almighty, not only in its written letter but in traditionary exposition; (9) that this law is immutable, neither to be added to nor diminished; (10) that God knows all our actions and governs them as He will; (11) that the observance of the law is rewarded and its violation punished in this world, but in a greater degree in the next; (12) that a Messiah is yet to appear, the time of whose coming may not be prescribed or foretold; and (13) that God will raise the dead at the last day and pass judgment upon all.

Fire-Worshippers.—The Parsees are at present the only devotees of Zoroaster, who is supposed to have founded the religion of the Fire-Worshippers about one thousand years before Christ. Its doctrines are set forth in the Zendavesta, the sacred books of the Parsees, who are supposed to have been the "Magi" of the Scriptures. Like the Koran of Mohammed, the Zendavesta is made up of the so-called inspired visions of the prophet Zoroaster, who preached Monotheism (one God), added to which were the principles of Good and Evil, having power over Men, the Good being recognized in the blazing flame, the Evil in the burned-out wood or charcoal; Night and Day, Sleeping and Waking, Death and Life. The Fire-Worshippers believed in the resurrection of the body, and held the idea of a Messiah, who was to be the awakener and mediator; they also recognized the doctrine of future rewards and punishments, and the efficacy of the prayers of the Good, who would become immortal, while for the wicked the end was annihilation.

Buddhism is the religion of China, Japan, the Malay Peninsula, and the Polynesian Islands, and governs the largest number of souls of any existing faith. Buddhism originated in northern Hindustan, in the sixth century B. C., and was founded by a Prince Siddhartha, Gautama, or Sakya (see Arnold's "Light of Asia"). To this prince, after the period of his ascetic and mendicant life, was given the name "Buddha," meaning, "he to whom truth is known," and from which is derived the name of the sect. The Buddhist faith is based upon belief in the doctrine of the transmigration of souls, by which every individual changes the nature of his existence at death, for better or for worse, in accordance with his behavior during that existence, being thus exalted or degraded, through all imaginable forms, from a clod to a divinity. This faith accepts no ultimate creator, and only finds final rest or happiness in annihilation.

Mohammedanism.

Though founded nearly 600 years after Christianity, Mohammedanism is a religion of the sword, conquering the mind and body rather than winning the heart.

The Mohammedan religion was started by Mohammed, of the tribe of Koreish, who was born in Mecca in 570 A. D., though it was not until he had reached his fortieth year that he first discovered the gift of prophecy, and began to see visions. He thereafter preached the doctrines which he claimed to have received by direct inspiration, a id which are contained in the Koran, of wh ch translations in French, English, and German can be found in the public libraries. Mohammedanism is made up of parts of Judaism and Christianity, the theory of its founder being that he was one (but the greatest) of a series of prophets, including both Abraham and Christ. It comprises belief in one God—"there is no God but God, and Mohammed is God's Apostle." It also peoples the unknown universe with angels—good and evil, and accepts the resurrection and the final judgment. It

establishes a Paradise and seven Hells, the lowest and deepest of which is for the "Hypocrites: those who, outwardly professing a religion, in reality had none." The Mohammedan belief further recognizes the inutility of "works" in influencing the final condition of man, assuming that it is not by these, but by God's mercy, that he is saved, and not damned. Predestination is a part of the creed, man's whole life and destiny being prefigured by Fate (Kismet). The efficacy of prayer is, however, established, and this form of worship enjoined upon "the Faithful;" this, with the sensual nature and characteristics of the Mohammedan Paradise, completes a superficial view of the peculiarities of this religion, as presented in the Koran.

Fetishism is still practiced by certain tribes in Africa and by the Indians of the Arctic regions of America.

Curiosities of the Bible.

There is no date from beginning to end in the Bible. It comprises sixty-six documents, or books and is supposed to have been written by about forty men; The Book of Isaiah has sixty-six chapters; fifty-four miracles are recorded in the Old and fifty-one in the New Testament; total 105. The shortest verse in the Old Testament is "Remember Lot's wife." The shortest one in the New Testament is John xi. 35, "Jesus wept," in point of words, but not in letters, another verse is as short, viz: Thessalonians v. 16, "Rejoice evermore." The longest verse is the ninth verse of the eighth chapter of Esther. Then there is one book, Esther, in which the Deity is not mentioned.

The Bible contains 3,566,480 letters, 773,746 words, 31,173 verses, 1,189 chapters and sixty-six books. The word "and" occurs 46,277 times. The word "Lord" occurs 1,855 times. The word "Reverend" occurs but once, which is in the ninth verse of the 111th Psalm. The middle verse is the eighth verse of the 118th Psalm. The 21st verse of the seventh chapter of Ezra contains all the letters of the alphabet, except the letter J. There are no words or names of more than six syllables.

A Description of Mount Ararat.

Ararat is divided into two peaks, Great Ararat on the northwest and Little Ararat on the southwest, whose bases blend while their summits are seven miles apart. The summit of Great Ararat is placed at 17,323 feet above the level of the sea, and 14,320 above its base; and for more than 3,000 feet below the summit it is always covered with ice and snow. Little Ararat is 13,000 feet above the sea level. The apex of Great Ararat was visited by Parrot, October 9, 1829. Dr. Schaff, in common with Smith, says that Ararat in Scripture refers to the lofty plateau or mountain-highlands which overlook the plain of the Araxes. The same authority states that the mountains of Ararat (Gen. viii. 4) more properly refer to the entire range of elevated tableland in that portion of the Armenia, and that upon some lower part of this range, rather than upon the high peaks, the ark more probably rested; and the following reasons are given in support of this view: This plateau or range is about 6,000 or 7,000 feet high; it is equally distant from the Euxine and the Caspian Seas, and between the Persian Gulf and the Mediterranean, and hence a central point for the dispersion of the race; the region is volcanic in its origin, does not rise into sharp crests, but has broad plains separated by subordinate ranges of mountains; and the climate is temperate, grass and grain are abundant, and the harvests are quick in nature. These facts, he believes, illustrate the Bible narrative.

New Testament Chronology.

First published in 1899 by Zahn, the greatest of German Biblical scholars.

	YEAR A. D.
Death and resurrection of Christ . .	30
Events recorded, Acts i–viii. . . .	1–34
Conversion of St. Paul	35
Three years' sojourning of Paul in Damascus, interrupted once by a journey to Arabia, flight from Damascus. First visit to Jerusalem, and stay at Tarsus	38
Peter at Joppa and Cæsarea, ...	40
Luke a church member at Antioch, Paul brought from Tarsus to	

Antioch, by Barnabas, either the summer or autumn of 43
Death of James, son of Zebedee. Imprisonment of Peter. Flight of the latter and other prophets from Jerusalem 44
Visit of Peter and others from Jerusalem to Antioch. Letter of St. James 50
First mission tour of Paul, spring 50 to fall 51
Apostles convene in Jerusalem, beginning of 52
Start of second mission tour of St. Paul, spring of 52
Arrival at Corinth, about November, 52
Epistle to the Galatians, beginning of 53
First Epistle to the Thessalonians, spring of 53
Second Epistle to the Thessalonians, summer 53
Journey from Corinth to Ephesus, before Pentecost, about May . . 54
Beginning of the third mission tour from Antiochia to Ephesus, probably summer 54
Arrival at Ephesus, about February, 55
Short visit to Corinth, from Ephesus.
Last Epistle of St. Paul to the Corinthians, end of 56 or beginning of 57
Letter of the Corinthians to St. Paul.
First Epistle of Paul to the Corinthians, Easter 57
Departure of Paul and Timothy from Ephesus by way of Troas to Macedonia, about or after Pentecost . . 57
Second Epistle to the Corinthians, about November or December . . 57
Journey of Paul from Macedonia to Corinth, about New Year . . . 58
Epistle to the Romans during a three months' stay in Greece and Corinth 58
Journey by way of Macedonia, Troas, Miletus, etc., to Jerusalem, and beginning of Captivity in Cæsarea. 58
Defense before Festus 60
Departure from Cæsarea, September. 60
Arrival at Rome, March 61
Epistles to the Ephesians, Collossians, and Philemon, summer of . 62
Second Epistle of St. Peter 62
Matthew writes his Aramaic Gospel. 62
Epistle to Philippians, summer of . 63
Paul free again, late in summer of . 63
Journey of Paul to Spain, fall 63 or spring 64
Arrival of Peter in Rome, fall 63 or spring 64
First Epistle of Peter, spring of . . 64
Mark in Rome, engaged on the completion of his Gospel, summer of . 64
Persecution under Nero and crucifixion of Peter, fall of 64
Return of Paul from Spain and visitation of the Eastern congregation, I Timothy and Titus, spring to fall 65
of Stay at Nicopolis, winter of . . . 65–66
Return of Paul to Rome, spring of . 66
Arrest of Paul. II Timothy; summer of 66
Paul beheaded, end of 66 or beginning of 67
Publication of Gospel of Mark, beginning 67
Departure of St. John and other Apostles to the province of Asia, beginning of 68
Epistle of Jude, beginning 75
Gospel and Acts of St. Luke, beginning 75
Epistle to the Hebrews, beginning . 80
Origin of the Greek Matthew, beginning 85
Gospel and the Epistles of John, between 80–90
Apocalypse of St. John, beginning . 95
Death of St. John, beginning . . . 100

Supposed Fate of the Apostles.

The following brief history of the fate of the Apostles may be new to those whose reading has not been evangelical:

St. Matthew is supposed to have suffered martyrdom, or was slain with the sword in a city of Ethiopia.

St. Mark was dragged through the streets of Alexandria, in Egypt, till he expired.

St. Luke was hanged upon an olive tree in Greece.

St. John was put in a caldron of boiling oil at Rome and escaped death. He afterward died a natural death at Ephesus in Asia.

St. James the Great was beheaded at Jerusalem.

St. James the Less was thrown from a pinnacle or wing of the temple and then beaten to death with a fuller's club.

St. Philip was hanged up against a pillar at Hieropolis, a city of Phrygia.

St. Bartholomew was flayed alive by the command of a barbarous king.

St. Andrew was bound to a cross, whence he preached unto the people till he expired.

St. Thomas was run through the body with a lance at Coromandel, in the East Indies.

St. Jude was shot to death with arrows.

St. Simon Zealot was crucified in Persia.

St. Matthias was first stoned and then beheaded.

St. Barnabas was stoned to death by Jews at Salania.

St. Paul was beheaded at Rome by the tyrant Nero.

ABOUT BOOKS AND WRITERS OF BOOKS

Names for Different Sizes of Books.

The name indicates the number of pages in the sheet, thus: In a folio book, 4 pages or 2 leaves = 1 sheet; a quarto. or 4to., has 8 pages or 4 leaves to a sheet; an octavo, or 8vo., 16 pages or 8 leaves to a sheet. In a 12mo., 24 pages or 12 leaves = 1 sheet, and the 18mo., 36 pages or 18 leaves = 1 sheet, and so on. The following are the approximate sizes of books:

Royal Folio	19	inches	× 12
Demy	18	"	× 11
Super Imp. Quarto (4 to)	15½	"	× 13
Royal 4to	12½	"	× 10
Demy 4to	11½	"	× 8½
Crown 4to	11	"	× 8
Royal Octavo	10½	"	× 6½
Medium 8vo.	9½	"	× 6
Demy 8vo.	9	"	× 5½
Crown 8vo.	7½	"	× 4½
Foolscap 8vo.	7	"	× 4
12mo.	7	"	× 4
16mo.	6½	"	× 4
Square 16mo.	4½	"	× 3½
Royal 24mo.	5½	"	× 3¼
Demy 24mo.	5	"	× 2¾
Royal 32mo.	5	"	× 3
Post 32mo.	4	"	× 2½
Demy 48mo.	3¾	"	× 2¼

Assumed Names of Well-known Writers.

Many of the greatest men and women of the literary world have placed upon the title pages of their books, and signed their contributions with an assumed name, or *nom de plume*. The following table will identify most of such authors of note. For convenience, the men and women writers are entered on separate lists:

NOM DE PLUME.	REAL NAME.
A Country Parson,	Archbishop Whately.
Agate,	Whitelaw Reid.
Alfred Crowquill,	A. H. Forrester.
Americus,	Dr. Francis Lieber.
Artemus Ward,	Charles F. Browne.
Asa Trenchard,	Henry Watterson.
Barry Cornwall,	Bryan Walter Proctor.
Benauly,	Benjamin Austin, and Lyman Abbott.
Besieged Resident,	Henry Labouchere.
Bill Arp,	Charles H. Smith.
Blythe White, Jr.,	Solon Robinson.
Bookworm,	Thomas F. Donnelly.
Boston Bard,	Robert S. Coffin.
Boz,	Charles Dickens.
Brick Pomeroy,	Mark M. Pomeroy.
Burleigh,	Rev. Matthew Hale Smith.
Burlington,	Robert Saunders.
Carl Benson,	Charles A. Bristed.
Chartist Parson,	Rev. Charles Kingsley.
Chinese Philosopher,	Oliver Goldsmith.
Chrystal Croftangry,	Sir Walter Scott.
Country Parson,	A. K. H. Boyd.
Danbury Newsman,	J. M. Bailey.
Diedrich Knickerbocker,	Washington Irving.
Dow, Jr.,	Elbridge G. Page.
Dr. Syntax,	William Combe.
Dunn Browne,	Rev. Samuel Fiske.
Edmund Kirke,	James Roberts Gilmore
Elia,	Charles Lamb.
Eli Perkins,	Matthew D. Landon.
English Opium-Eater,	Thomas DeQuincey.
Ettrick Shepherd,	James Hogg.
Eugene Pomeroy,	Thomas F. Donnelly.
Falconbridge,	Jonathan F. Kelly.
Fat Contributor,	A. M. Griswold.
Father Prout,	Francis Mahoney.
Frank Forrester,	Henry W. Herbert.
Gath, also Laertes,	George Alfred Townsend.
Geoffrey Crayon,	Washington Irving.
George Fitzboodle,	William M. Thackeray.
George Forest,	Rev. J. G. Wood.
Hans Breitmann,	Charles Godfrey Leland.
Hans Yokel,	A. Oakley Hall.
Harry Hazell,	Justin Jones.

NOM DE PLUME.	REAL NAME.
Harry Lorrequer,	Charles Lever.
Hibernicus,	De Witt Clinton.
Historicus,	William G. Vernon Harcourt.
Hosea Bigelow,	James Russell Lowell.
Howadji,	George William Curtis.
Howard,	Mordecai Manuel Noah.
Hyperion,	Josiah Quincy.
Ik Marvel,	Donald G. Mitchell.
Irenæus,	Rev. S. Irenæus Prime, D. D.
Isabel,	William Gilmore Simms.
Janus,	Dr. Dollinger.
Jay Charlton,	J. C. Goldsmith.
Jedediah Cleishbotham,	Sir Walter Scott.
John Chalkhill,	Izaak Walton.
John Darby,	J. C. Garretson.
John Paul,	C. H. Webb.
John Phœnix, Gentleman,	George H. Derby.
Josh Billings,	Henry W. Shaw.
Joshua Coffin,	H. W. Longfellow.
Kirwan,	Rev. Nicholas Murray.
K. N. Pepper,	James M. Morris.
Laicus,	Rev. Lyman Abbott.
Launcelot Wagstaffe, Jr.,	Charles Mackay.
Lemuel Gulliver,	Jonathan Swift.
Major Jack Downing,	Seba Smith.
Mark Twain,	Samuel L. Clemens.
Max Adler,	Charles H. Clark.
M. Quad,	Charles B. Lewis.
Mrs. Partington,	B. P. Shillaber.
M. T. Jug,	Joseph Howard.
Ned Buntline,	Edward Z. C. Judson.
Nym Crinkle,	A. C. Wheeler.
Old Bachelor,	George William Curtis.
Old Cabinet,	R. Watson Gilder.
Old Humphrey,	George Mogridge.
Old 'Un,	Francis Alexander Durivage.
Oliver Optic,	William Taylor Adams.
Ollapod,	Willis G. Clark.
Orpheus C. Kerr,	Robert H. Newell.
Owen Meredith,	Lord Lytton.
Parson Brownlow,	Wm. Gunnaway Brownlow.
Paul Creyton,	J. T. Trowbridge.
Pen Holder,	Rev. Edward Eggleston.
Pequot,	Charles W. March.
Perley,	Benj. Perley Poore.
Peter Parley.	S. C. Goodrich.
Peter Pindar,	Dr. John Wolcot.
Petroleum V. Nasby,	D. R. Locke.
Phœnix,	Sir Henry Martin.
Poor Richard,	Benjamin Franklin.
Porte Crayon,	David H. Strother.
Private Miles O'Reilly,	Charles G. Halpine.
Robinson Crusoe,	Daniel Defoe.
Runnymede,	Lord Beaconsfield.
Rustic Bard,	Robert Dinsmore.
Sam Slick,	Thomas C. Halliburton.
Sparrowgras,	F. S. Cozzens.
Teufelsdroeckh,	Thomas Carlyle.
Teutha,	William Jerdan.
The Black Dwarf,	Thomas J. Wooler.
The Celt,	Thomas Davis.

NOM DE PLUME.	REAL NAME.
The Druid,	Henry H. Dixon.
The Governor,	Henry Morford.
The Traveller.	Isaac Stary.
Theodore Taylor,	J. C. Hotten.
Thomas Ingoldsby,	Rev. R. H. Barham.
Thomas Little,	Thomas Moore.
Thomas Rowley,	Thomas Chatterton.
Timon Fieldmouse,	William B. Rands.
Timothy Tickler,	Robert Syme.
Timothy Titcomb,	Dr. J. G. Holland.
Tom Brown,	Thomas Hughes.
Tom Folio,	Joseph E. Babson.
Tom Hawkins,	Theodore W. A. Buckley.
Trinculo,	John A. Cockerill.
Tristam Merton,	Thomas B. Macaulay.
Two Brothers,	A. and C. Tennyson.
Ubique,	Parker Gilmore.
Uncle Hardy,	William Senior.
Uncle John,	Elisha Noyce.
Uncle Philip,	Rev. Dr. F. L. Hawks.
Uncle Toby,	Rev. Tobias H. Miller.
Veteran Observer	E. D. Mansfield.
Vigilant,	John Corlett.
Vivian,	George H. Lewes.
Vivian Joyeux,	W. M. Praed.
Walter Maynard,	William Beale.
Warhawk,	William Palmer.
Warrington,	W. P. Robinson.
Warwick,	F. O. Otterson.
Waters,	William H. Russell.
What's His Name,	E. C. Massey.
Wilibald, Alexis,	William Haering.
Wizard,	John Corlett.

NOM DE PLUME.	REAL NAME.
Amy Lothrop,	Miss Anna B. Warner.
American Girl Abroad,	Miss Trafton.
Aunt Kitty,	Maria J. Mackintosh.
Aunt Mary,	Mary A. Lathbury.
Christopher Crowfield,	Mrs. Harriet Beecher Stowe.
Cousin Alice,	Mrs. Alice B. Haven.
Cousin Kate,	Catherine D. Bell.
Charles Egbert Craddock,	Miss Murfree.
Currer Bell,	Charlotte Bronte (Mrs. Nichols.)
Dolores,	Miss Dickson.
E. D. E. N.	Mrs. Emma D. E. N. Southworth.
Eleanor Kirke,	Mrs. Nolly Ames.
Elizabeth Wetherell,	Susan Warner.
Ella Rodman,	Mrs. Eliza Rodman.
Ellis Bell,	Emily J. Bronte.
Fanny Fern,	Mrs. James Parton.
Fanny Fielding,	Mary J. S. Upsher.
Fanny Forester,	Emily C. Judson.
Florence Percy,	Mrs. Elizabeth Akers Allen.
Gail Hamilton,	Miss Mary Abigail Dodge.
George Eliot,	Mrs. Marian Lewes Cross.
George Sand,	Mme. Amantine Lucille Aurore Dudevant.
Grace Greenwood,	Mrs. Sarah J. Lippincott.
Grace Wharton,	A. T. Thompson.
Harriet Myrtle,	Mrs. Lydia F. F. Miller.

NOM DE PLUME.	REAL NAME.
Hesba Stretton,	Miss Hannah Smith.
Howard Glyndon,	Laura C. Redden.
Ianthe,	Emma C. Embury.
Jennie June,	Mrs. Jennie C. Croly.
John Oliver Hobbs,	Mrs. Perry Cragie.
John Strange Winter,	Mrs. Stannard.
Kate Campbell,	Jane Elizabeth Lincoln.
Louise Muhlbach,	Clara Mundt.
Marion Harland,	Mary V. Terhune.
Minnie Myrtle,	Miss Anna C. Johnson.
Mintwood,	Miss Mary A. E. Wager.
Octave Thanet,	Miss Alice French.
Olivia,	Emily Edson Grigg.
Ouida,	Louisa De La Rame.
Patty Lee,	Alice Cary.
Perdita,	Mrs. Mary Robinson.
Saxe Holm,	Miss Rush Ellis.
Shirley Dare,	Mrs. Susan D. Waters.
Sophie May,	Mrs. Eckerson.
Sophie Sparkle,	Jennie E. Hicks.
Straws, Jr.,	Kate Field.
Susan Coolidge,	Miss Woolsey.
Una,	Mary A. Ford,

Great Men's Reading.

Beethoven was fond of history and novels.

Cowper read only his Bible and his prayer-book.

Hallam said that Livy was the model historian.

Chopin rarely read anything heavier than a French novel.

Auber hated reading, and never read save under compulsion.

Cæsar Borgia had a library of works relating mostly to art.

Titian read his prayer-book and the Metamorphoses of Ovid.

Voltaire's favorite classical author was Juvenal, the satirist.

Rossini, for nearly thirty years, read nothing but French novels.

Jean Paul Richter had only five or six books, all philosophical.

Paul Veronese thought there was no book equal to the "Æneid."

Lord Clive said that "Robinson Crusoe" beat any book he ever read.

Franklin read all he could find relating to political economy and finance.

Michael Angelo was fondest of the Books of Moses and the Psalms of David.

Bach was no great reader, but much enjoyed books of jokes and funny stories.

Hogarth was fond of joke-books and farces, and enjoyed them immoderately.

Cherubini was a lover of botany, and made collections of works on the subject.

Mario, the great tenor, read anything he could obtain relating to sports or hunting.

George III., for many years of his life, read nothing but his Bible and prayer-book.

"Papa" Hadyn liked stories, and he said, "The more love there is in them the better."

St. John Chrysostom never tired of reading or of praising the works of the Apostle John.

Da Vinci read Pindar, and thought him the noblest poet who ever wrote in any language.

Swift made a special study of the Latin satirists, and imitated their style and language.

Heine seldom read anything but poetry, but he read that with the most scrupulous attention.

Baxter read only the Bible, and best enjoyed the Prophecies of Isaiah and the Psalms.

Wordsworth was fond of the poetry of Burns, but said the latter was too rough and uncouth.

Molière was a reader of romances. His plays give many evidences of his excellent memory.

Wagner was a close student of musical history, and made that line of reading a specialty.

Bulwer-Lytton's favorite author was Horace. He always carried a small edition in his pocket.

Charles II., of England, delighted in Chaucer, and thought him the greatest poet that ever lived.

Carlyle had a very large library, relating principally to German and French literature and history.

Lablache, the stout basso, was a student of botany, and had quite a collection of botanical works.

Tennyson was a close student of the old English tales, and had a large library of such literature.

Landseer was a student of anatomy and zoology, and made collections of books on these subjects.

James I., of England, was a lover of the classics, and very familiar with most of the Latin writers.

Bunyan read little besides his Bible, and often said that Christians would do well to read no other book.

Vandyke, the painter, was fond of the Decameron, and often, in conversation, quoted from its pages.

Bolingbroke was a warm admirer of the French philosophical writers, and had a large collection of their works.

Hannah More made a collection of educational works, and read extensively on the line of female education.

Cardinal Richelieu once said that Tibullus, the Latin erotic poet, was the most natural of all the ancients.

Louis XIV. thought that Ovid's "Art of Love" was one of the most charming books that had ever been written.

Goethe once said that his literary life was determined by a volume of folk-lore tales he read when a child.

Julius Cæsar was a close student of Homer, and said that all military science was comprised in its pages.

David, the French historical painter, was a student of French history, to the exclusion of almost all other reading.

Salvator Rosa liked any kind of poetry, but more especially that relating to the country or to country scenes.

Mrs. Siddons gave much attention to the history of the drama, and had an extensive library of this kind of matter.

Tolstoi is said to have a large library of sociology, and to read attentively any book bearing on some new social fad.

Addison's specialty was the history of medals and coins, and he eagerly perused anything treating of this subject.

Mendelssohn was a close student of Jewish history and remarkably well informed as to every particular of Jewish annals.

Twelve Greatest Books of the Nineteenth Century.

The following are generally conceded to be the twelve greatest books of the nineteenth century: Darwin's, "Origin of the Species;" Hegel's "Logic," and "Philosophy of Religion;" Goethe's, "Faust;" Emerson's, "Essays;" Harriet Beecher Stowe's, "Uncle Tom's Cabin;" Sir Walter Scott's, "Historical Novels;" William Wordsworth's, "Poems;" Alfred Tennyson's, "In Memoriam;" Victor Hugo's, "Les Miserables;" John Ruskin's, "Modern Painters;" Thomas Carlyle's, "Sartor Resartus;" Strauss', "Life of Jesus."

Newspapers in the United States and the World.

In 1775 there were only twenty-seven newspapers published in the United States. Ten years later, in 1785, there were seven published in the English language in Philadelphia alone, of which one was a daily. The oldest newspaper published in Philadelphia at the time of the Federal convention was the *Pennsylvania Gazette*, established by Samuel Keimer, in 1728. The second newspaper in point of age was the *Pennsylvania Journal*, established in 1742 by William Bradford, whose uncle, Andrew Bradford, established the first newspaper in Pennsylvania, the *American Weekly Mercury*, in 1719. Next in age, but the first in importance, was the *Pennsylvania Packet*, established by John Dunlap in 1771. In 1784 it became a daily, being the first daily newspaper printed on this continent.

Newspapers for the Year 1900.

Rowell's "American Newspaper Directory" for 1900 reports the number of newspapers published in the United States and Canada as 21,789. Of these, 924 were Canadian publications. The following was the frequency of issue: Weekly, 15,375; monthly, 2,939; daily, 2,279; semi-monthly, 296; semi-weekly, 470; quarterly, 180; bi-weekly, 76; bi-monthly, 68; tri-weekly, 52 —total, 21,789.

The total number of *newspapers* published in the world at present is estimated at about 50,000, distributed as follows: United States and Canada, 21,789; Germany, 7,000; Great Britain, 9,000; France, 4,300; Japan, 2,000; Italy, 1,500; Austria-Hungary, 1,200; Asia, exclusive of Japan, 1,000; Spain, 850; Russia, 800; Australia, 800; Greece, 600; Switzerland, 450; Holland, 300; Belgium, 300; all others, 1,000. Of these more than half are printed in the English language.

Lubbock's List of the Hundred Best Books.

The Bible.
Confucius, *Analects.*
Aristotle, *Ethics.*
Apostolic Fathers.
Pascal, *Pensées.*
Comté, *Positive Philosophy.*
Jeremy Taylor, *Holy Living.*
Keble, *Christian Year.*
Plato's *Dialogues.*
Demosthenes' *De Corona.*
Horace, *Poems.*
Homer, *Iliad and Odyssey.*
Virgil, *Aeneid.*
Malory, *Morte d' Arthur.*
Haha-Bharata, *Ramayana.*
Æschylus, *Prometheus.*
Sophocles, *Edipus, Trilogy.*
Aristophanes, *The Knights.*
Xenophon, *Anabasis.*
Tacitus, *Germania.*
Gibbon, *Decline and Fall.*
Grote, *Greece.*
Smith, *Wealth of Nations.*
Humboldt, *Travels.*
Shakespeare.
Dante, *Divina Commedia.*
Dryden's *Poems.*
Gray, *Poems.*
Wordsworth, *Poems.*
Pope, *Poems.*
Swift, *Gulliver's Travels.*
Arabian Nights.
Burke, *Political Writings.*
The English Essayists.
Sheridan, *Dramas.*
Smiles, *Self Help.*
George Eliot, *Adam Bede.*
Marcus Aurelius, *Meditations.*
Green, *Short History of England.*
Mill *Logic and Political Economy.*
Descartes, *Discours sur la Methode.*
Lewes, *History of Philosophy.*
Goethe's *Faust and Wilhelm Meister.*
Thackeray, *Vanity Fair and Pendennis*
Bulwer-Lytton, *Last Days of Pompeii.*
Thomas à Kempis, *Imitation.*
Spinoza, *Tractatus Theologico-Politicus.*
Bunyan, *Pilgrim's Progress.*
Epictetus, *Philosophy.*
(St. Hilaire), Le Bouddha.
Mahomet, *Koran.*
Butler, *Analogy.*
Aristotle, *Politics.*
Lucretius, *Philosophical Poems.*
Plutarch, *Lives.*
Nibelungen Lied.
She-king (*Chinese Odes*).
Firdusi, *Shah-Nameh.*
Trilogy, or Persae.
Euripides, *Medea.*
Herodotus, *History.*
Thucydides, *History.*
Livy, *History.*
Hume, *England.*
Bacon, *Novum Organum.*
Darwin, *Origin of Species.*
Locke, *On the Understanding*
Cook, *Voyage.*
Milton, *Paradise Lost.*
Spenser, *Fœrie Queene.*
Chaucer, *Canterbury Tales.*
Burns, *Poems.*
Scott, *Poems.*
Heine, *Poems and Tales.*
Goldsmith, *Vicar.*
Southey, *Poems.*
Defoe, *Robinson Crusoe.*
Cervantes, *Don Quixote.*
Boswell, *Johnson.*
Moliere, *Dramas.*
Voltaire, *Zadig.*
Carlyle, *Past and Present.*
Kingsley, *Westward Ho!*
Scott, *Novels.*
Kingsley, *Heroes; Water Babies.*
Hawthorne's *Tanglewood Tales.*
Hawthorne's *Wonder Book.*
Kingsley's *Madame How and Lady Why.*
Marryatt, *Japhet in Search of a Father.*
Alice's Adventures in Wonderland.
Lanier, *Boy's King Arthur.*
Love Me Little, Love Me Long.
Irving, *Knickerbocker's New York.*
Cicero, *De Officiis, De Amicitia and De Senectute.*
Carlyle, *French Revolution.*
Berkeley, *Human Knowledge.*
Darwin, *Naturalist in the Beagle.*
White, *Natural History of Selbourne.*
Miss Austen, *Emma, or Pride and Prejudice.*
Dickens, *Pickwick and David Copperfield.*

THE TEN GREATEST PREACHERS.

Paul.	Spurgeon.
Whitefield.	Beecher.
Massillon.	Fuller.
Bossuet.	Taylor.
Luther.	Knox.

THE TEN GREATEST PHILOSOPHERS.

Aristotle.	Descartes.
Plato.	Berkeley.
Seneca.	Hamilton.
Bacon.	Le Comte.
Locke.	Spencer.

THE TEN GREATEST REFORMERS.

Luther.	John Huss.
Wycliffe.	Savonarola.
Calvin.	Cranmer.
Wesley.	Melanchthon.
Knox.	Zwingli.

THE TEN GREATEST HISTORIANS.

Herodotus.	Thucycides.
Gibbon.	Livy.
Hume.	Tacitus.
Macaulay.	Hallam.
Brancroft.	Froude.

THE TEN GREATEST POETS.

Æschylus.	Tasso.
Homer.	Dante.
Virgil.	Milton.
Chaucer.	Shakespeare
David.	Camoens.

THE TEN GREATEST PAINTERS.

Michael Angelo.	Reynolds.
Raphael.	Da Vinci.
Titian.	Veronese.
Rubens.	Guido.
West.	Rembrandt.

THE TEN GREATEST SCULPTORS.

Phidias.	Flaxman.
Praxiteles.	Thorwaldsen.
Michael Angelo.	Donatello.
Cellini.	Powers.
Canova.	Crawford.

THINGS REMARKABLE AND CURIOUS

The Largest Bell in the world is the great bell of Moscow, at the foot of the Kremlin. Its circumference at the bottom is nearly 68 feet, and its height more than 21 feet. In its stoutest part it is 23 inches thick, and its weight has been computed to be 443,772 pounds. It has never been hung, and was probably cast on the spot where it now stands. A piece of the bell is broken off. The fracture is supposed to have been occasioned by water having been thrown upon it when heated in consequence of the building erected over it being on fire.

The Largest Theatre in the world is the new Opera-house in Paris. It covers nearly three acres of ground; its cubic mass is 4,287,000 feet; it cost about 100,000,000 francs. *The largest suspension bridge* is the one between New York City and Brooklyn; the length of the main span is 1,595 feet 6 inches; the entire length of the bridge is 5,980 feet. *The loftiest active volcano* is Popocatapetl—"smoking mountain"—thirty-five miles southwest of Puebla, Mexico; it is 17,748 feet above the sea level, and has a crater three miles in circumference, and 1,000 feet deep. *The longest span of wire* in the world is used for a telegraph in India over the River Kistnah. It is more than 6,000 feet in length, and is 1,200 feet high.

The Greatest Fortress from a strategical point of view, is the famous stronghold of Gibraltar. It occupies a rocky peninsula jutting out into the sea, about three miles long and three-quarters of a mile wide. One central rock rises to a height of 1,435 feet above the sea-level. Its northern face is almost perpendicular, while its east side is full of tremendous precipices. On the south it terminates in what is called Europa Point. The west side is less steep than the east, and between its base and the sea is the narrow, almost level span on which the town of Gibraltar is built. The fortress is considered impregnable to military assault. The regular garrison in time of peace numbers about 7,000.

The Biggest Cavern is the Mammoth Cave, in Edmonson County, Kentucky. It is near Green River, about six miles from Cave City, and twenty-eight from Bowling Green. The cave consists of a succession of

irregular chambers, some of which are large, situated on different levels. Some of these are traversed by the navigable branches of the subterranean Echo River. Blind fish are found in its waters.

The Longest Tunnel in the world is that of the St. Gothard, on the line of railroad between Lucerne and Milan. The summit of the tunnel is 900 feet below the surface at Andermatt, and 6,600 feet beneath the peak of Kastlehorn, of the St. Gothard group. The tunnel is 26½ feet wide, and is 18 feet 10 inches from the floor to the crown of the arched roof. It is 9½ miles long.

The Biggest Trees in the world are the mammoth trees of California. One of a grove in Tulare County, according to measurements made by members of the State Geological Survey, was shown to be 276 feet in height, 108 feet in circumference at base, and 76 feet at a point 12 feet above ground. Some of the trees are 376 feet high, and 34 feet in diameter. Some of the largest that have been felled indicate an age of from 2,000 to 2,500 years.

The Largest Library is the Bibliotheque National, in Paris, founded by Louis XIV. It contains 1,400,000 volumes, 300,000 pamphlets, 173,000 manuscripts, 300,000 maps and charts, and 150,000 coins and medals. The collection of engravings exceeds 1,300,000, contained in some 10,000 volumes.

The Largest Desert is that of Sahara, a vast region of Northern Africa, extending from the Atlantic Ocean on the west to the valley of the Nile on the east. The length from east to west is about 3,000 miles, its average breadth about 900 miles, its area about 2,000,000 square miles. In summer the heat during the day is excessive, but the nights are often cold.

First Things.

The first steamboat plied the Hudson in 1807.

The first sawmakers' anvil was brought to America in 1819.

The first use of a locomotive in this country was in 1820.

Kerosene was first used for lighting purposes in 1826.

The first horse railroad was built in 1826–7.

The first lucifer match was made in 1829.

The first iron steamship was built in 1830.

The first steel pen was made in 1830.

Omnibuses were introduced in New York in 1830.

Ships were first "copper-bottomed" in 1837.

Envelopes were first used in 1839.

Anæsthetics were discovered in 1844.

The first steel-plate was made in 1830.

The entire Hebrew Bible was printed in 1488.

Gold was first discovered in California in 1848.

Christianity was introduced into Japan in 1549.

First almanac printed by George Von Furback in 1460.

Percussion arms were used in the United States Army in 1830.

The first glass factory in the United States was built in 1780.

The first complete sewing-machine was patented by Elias Howe, Jr., in 1846.

The first temperance society in this country was organized in Saratoga County, N. Y., in March, 1808.

The first daily newspaper appeared in 1702. The first newspaper printed in the United States was published in Boston on September 25, 1790.

The first telegraph instrument was successfully operated by S. F. B. Morse, the inventor, in 1835, though its utility was not demonstrated to the world until 1842.

The first Union flag was unfurled on the 1st of January, 1776, over the camp at Cambridge. It had thirteen stripes of white and red, and retained the English cross in one corner.

When Captain Cook first visited Tahiti, the natives were using nails of wood, bone, shell, and stone. When they saw iron nails, they fancied them to be shoots of some very hard wood, and, desirous of securing such a valuable commodity, they planted them in their gardens.

In 1750 the "shoe-black" came into vogue. The poet Gay, in his day, refers to the business, and describes a mother as instructing her son in this calling.

The 19th Century in a Nutshell.

The Nineteenth century received from its predecessors the horse; we bequeathed the bicycle, the locomotive, and the motor car.

We received the goose quill and bequeathed the typewriter.

We received the scythe and bequeathed the mowing machine.

We received the hand printing press; we bequeathed the cylinder press.

We received the painted canvas; we bequeathed lithography, photography and color photography.

We received the hand-loom; we bequeathed the cotton and woolen factory.

We received gunpowder; we bequeathed lyddite.

We received the tallow dip; we bequeathed the electric lamp.

We received the galvanic battery; we bequeathed the dynamo.

We received the flint-lock; we bequeathed Maxims.

We received the sailing ship; we bequeathed the steamship.

We received the beacon signal fire; we bequeathed the telephone and wireless telegraphy.

We received ordinary light; we bequeathed Roentgen rays.

The Paris Exposition of 1900.

The Paris Universal International Exposition of 1900 was formally declared open by President Loubet April 14, and closed its doors November 12. During its existence 50,000,000 paying visitors passed through its gates. The largest attendance in one day was 600,000. (The number of paying visitors at the Chicago Fair of 1893 was 27,529,000; the largest number of visitors in one day over 700,000.) The French exhibitors at Paris were naturally the most numerous and received the largest number of prizes, but the following is a statement of the awards to the exhibitors of the four foreign nations having the largest representation:

In the electrical department, Group 5, the United States led the world, receiving 94 awards, of which 6 were grand prizes. Germany came next in this section, but received only 49 prizes.

In transportation the United States led, receiving 130 awards, with Germany next, 123 prizes, and Great Britain third, having 119 prizes. There were many surprises when the final awards were made, and none more so than in the Department of Foodstuffs, Group 10, in which Italy surpassed all other nations, with 306 awards. The United States came fifth, with 177 awards.

Nation.	Grand Prix.	Gold.	Silver.	Bronze.	Honorable Mention.	Total Awards.	Total No. Exhibitors.
United States	215	547	593	501	348	2,204	6,916
Germany . .	236	510	575	321	184	1,826	2,689
England . .	183	406	517	410	208	1,727	2,959
Russia . . .	209	346	411	321	206	1,493	2,285

In Group 11, Mining and Metallurgy, the United States surpassed all nations. This American display was a magnificent one, commanding the admiration of every visitor, and the awards were 133, of which 34 were grand prizes.

The jury of final appeal in the matter of prizes to be awarded by the Exposition Management closed its work in September. The statement prepared for the United States committee shows that America received the highest number of awards of any nation save France, and that she also received more awards in each classification, except grand prizes, in which Germany secured 236, against the United States 215. These figures, excepting for France, are shown in above table.

Owners of Land in America.

Nearly 22,000,000 acres of land are owned by men who owe allegiance to other governments. To be exact, there are 21,241,900 acres of land under the direct control and management of thirty foreign individuals or companies. There are 2,720,283 acres of land in Massachusetts, so that the men living in other countries and owing allegiance to other powers own land enough to make about ten States like Massachusetts, more than the whole of New England, more land than some governments own to support a king. The largest amount of land owned by any one man or corporation is by a company called the Holland Land Company. There is twice as much land owned by aliens in the United States as there is owned by Englishmen in Ireland.

Principal Battles of the Civil War. Dates, Commanders, and Number Killed on Both Sides.

Bull Run (first), July 21, 1861—North, General McDowell; killed, 481; South,

General Beauregard; killed, 269. *Shiloh*, April 7, 1862—North, General Grant; killed, 1,735; South, General A. S. Johnston; killed, 1,728. *Seven Pines* and *Fair Oaks*, May 31 and June 1, 1862—North, General McClellan; killed, 890; South, General J. E. Johnston; killed, 2,800. *Seven Days*, June 25–July 1, 1862—North, General McClellan; killed 1582; South, General Lee; killed unknown. *Second Bull Run*, August 29–30, 1862—North, General Pope; South, General Lee; no exact estimate. *Antietam*, Sept. 16 and 17, 1862—North, General McClellan; killed, 2,010; South, General Lee; killed, 3,500. *Corinth*, October 3–4, 1862—North, General Rosecrams; killed, 315; South, General Van Dorn; killed, 1,423. *Perryville*, October 8, 1862—North, General Buell; killed, 820; South, General Bragg; killed, 1,300. *Fredericksburg*, December 11–15, 1862—North, General Burnside; killed, 1128; South, General Lee; killed, 1,200. *Murfreesboro*, December 31, 1862, January 1, 1863—North, General Rosecrans; killed, 1,474; South, General Johnston; killed, unknown. *Chancellorville*, May 2 and 3, 1863—North, General Hooker; killed, 1,512; South, General Lee; killed, 1,581. *Gettysburg*, July 1, 2 and 3, 1863—North, General Meade; killed, 2,834; South, General Lee; killed, 3,500. *Vicksburg*, July 3 and 4, 1863—North, General Grant; killed, 545; South, General Pemberton; killed, unknown. *Chickamauga*, Sept. 19–23, 1863—North, General Thomas; killed, 1,644; South, General Bragg; killed, 2,389. *Lookout Mountain and Missionary Ridge*, November 23–25, 1863—North, General Grant; total loss, 4,000; South, General Bragg; total loss, 4,000. *Wilderness*, May 5–7, 1864—North, General Grant; killed, unknown; South, General Lee; killed, unknown. *Spottsylvania*, May 8–18, 1864—North, General Grant; killed, 2,261; South, General Lee; killed, unknown. *Cold Harbor*, June 1, 1864—North, General Grant; total loss, 10,000; South, General Lee; total loss, 8,000. *Franklin*, November 30, 1864—North, General Schofield; killed 189; South, General Hood; killed 1750. *Nashville*, December 1–14, 1864—North, General Thomas; total loss, 6,500; South, General Hood; total loss, 23,000. *Five Forks*, April 1, 1865; North, General Grant; total loss, 7,000; South, General Lee; total loss, 15,000.

Growth of the United States.

This country began the present century with 5,308,483 people. In the year 1810 the population was 7,239,881, an increase of 36.28 per cent.; in 1820 it was 9,633,822, an increase of 33.66 per cent.; in 1830 it was 12,866,020, an increase of 32.51 per cent.; in 1840 it was 17,069,453, an increase of 32.52 per cent.; in 1850 it was 23,191,876, an increase of 35.83 per cent.; in 1860 it was 31,443,321, an increase of 35.11 per cent.; in 1870 it was 38,558,371, an increase of 22.65 per cent.; in 1880 it was 50,154,783, an increase of 30.08 per cent.; in 1890 it was 62,622,250, an increase of about 28 per cent.; in 1900 it was 76,295,220. This is exclusive of the islands of Porto Rico, the Hawaiian and the Phillippine islands, which bring about 10,000,000 more people under our dominions.

This great growth is shown by a few comparisons. The British Islands began the present century with three times as many people as the United States, and yet its present population is less than three-fifths of our own. Of all the civilized countries, Russia has the most people, but at our rate of increase it will not be many years before this country passes Russia. Another interesting fact is that the English language is spreading twice as rapidly as any other tongue, so that the future promises to the United States not only leadership in population, but in the language of the world.

In this connection it will be interesting to compare and note

How the Great Powers Have Changed Rank in 100 Years.

The change of the seats of power will be seen by a comparison of the relative populations of 1800 and 1900.

In 1800 the great powers of the world were thus grouped:

Russia	38,140,000
France	27,720,000
Germany	22,330,000
Austria	21,230,000
United Kingdom	15,570,000

Italy	13,380,000
Spain	10,440,000
United States	5,310,000

In the year 1900 we have the following figures:

Russia	130,896,628
United States	76,295,220
Germany	53,000,000
Austria-Hungary	42,660,906
United Kingdom	49,559,954
France	38,517,975
Italy	31,000,000
Spain	18,250,000

Of this population the English-speaking races in Great Britain and Ireland, with the English-speaking colonies, and the United States, number 130,000,000, offsetting Russia's 130,896,628.

Politics of the Presidents.

The subjoined table will be found interesting as a reference to many of our readers. Of course, the name of Washington heading the list does not mean that he was the candidate of any party or faction, but is placed there to complete the roll:

Name.	Inauguration.	Politics.
George Washington	April 30, 1789	Unanimous.
John Adams	March 4, 1797	Federal.
Thomas Jefferson	March 4, 1801	Democrat.
James Madison	March 4, 1809	Democrat.
James Monroe	March 4, 1817	Democrat.
John Quincy Adams	March 4, 1825	Compromise
Andrew Jackson	March 4, 1829	Democrat.
Martin Van Buren	March 4, 1837	Democrat.
William H. Harrison	March 4, 1841	Whig.
John Tyler	April 6, 1841	Whig.
James K. Polk	March 4, 1845	Democrat.
Zachary Taylor	March 5, 1849	Whig.
Millard Fillmore	July 9, 1850	Whig.
Franklin Pierce	March 4, 1853	Democrat.
James Buchanan	March 4, 1857	Democrat.
Abraham Lincoln	March 4, 1861	Republican.
Andrew Johnson	April 15, 1865	Republican.
U. S. Grant	March 4, 1869	Republican.
R. B. Hayes	March 5, 1877	Republican.
James A. Garfield	March 4, 1881	Republican.
Chester A. Arthur	Sept. 20, 1881	Republican.
Grover Cleveland	March 4, 1885	Democrat.
Benj. Harrison	March 4, 1889	Republican.
Grover Cleveland	March 4, 1893	Democrat.
William McKinley	March 4, 1897	Republican.
William McKinley	March 4, 1901	Republican.

Education of Presidents.

Washington—Fair English education.
Adams—Harvard College.
Jefferson—William and Mary.
Madison—Princeton College.
Adams, J. Q.—Harvard College.
Jackson—Limited education.
Van Buren—Academic course.
Harrison, W. H.—Hampden College.
Tyler—William and Mary.
Polk—University of North Carolina.
Taylor—Slight, the rudiments.
Fillmore—Limited education.
Pierce—Bowdoin College.
Buchanan—Dickinson College.
Lincoln—Education limited.
Johnson—Self-educated.
Grant—West Point.
Hayes—Kenyon College.
Garfield—Williams College.
Arthur—Union College.
Cleveland—Hamilton College.
Benj. Harrison—Miami University.
McKinley—Allegheny College.

Religion of the Presidents.

All of our Presidents except Jefferson were members of churches or were men who revered Christianity. Adams married a minister's daughter, and was inclined to Unitarianism. Jefferson was not a believer, at least while he was Chief Magistrate. Madison's early connections were Presbytarian. Monroe is said to have favored the Episcopal Church. John Quincy Adams was like his father. Jackson was a Presbyterian and died in the communion of that church. Van Buren was brought up in the Reformed Dutch Church, but afterward inclined to the Episcopal Church. Harrison leaned toward the Methodist Church, and Tyler was an Episcopalian. Polk was baptized by a Methodist preacher after his term of office expired. Taylor was inclined to the Episcopal communion. Fillmore attended the Unitarian Church, and Franklin Pierce was a member, but not a communicant, of a Congregational Church at Concord. Buchanan was a Presbyterian, as was also Benjamin Harrison. General Grant attended the Methodist Church, and President Garfield the Church of the Disciples. Cleveland, the son of a Presbyterian minister, remained in that faith, while McKinley, from boyhood, was an active worker in the Methodist Church. Roosevelt is a member of the Dutch Reformed Church.

Cabinet Facts of Interest.

There were six Secretaries of State who afterward became Presidents, namely,

Jefferson, Madison, Monroe, John Quincy Adams, Van Buren, and Buchanan. Monroe was Secretary of War for a short time after he had served in the State Department, and General Grant was Secretary of War *ad interim*. There have been no Secretaries of the Treasury, the Navy, or the Interior, nor any Postmasters or Attorney-Generals who have become President. Jeff Davis was Secretary of War under President Pierce.

Salaries of United States Officers, Per Annum.

PRESIDENT, VICE-PRESIDENT AND CABINET.—President, $50,000; Vice-President, $8,000; Cabinet Officers, $8,000 each.

UNITED STATES SENATORS. — $5,000 with mileage.

CONGRESS.--Members of Congress, $5,000 with mileage.

SUPREME COURT.—Chief Justice, $10-500; Associate Justices, $10,000.

CIRCUIT COURTS.—Justices of Circuit Courts, $6,000.

HEADS OF DEPARTMENTS.—Supt. of Bureau of Engraving and Printing, $4,500; public printer $4,500; Supt. of Census, $6,000; Supt. of Naval Observatory, $5,000; Supt. of the Signal Service, $4,000; Director of Geological Surveys, $6,000; Director of the Mint, $4,500; Commissioner of General Land Office, $4,000; Commissioner of Pensions, $5,000; Commissioner of Labor, $5000; Commissioner of Indian Affairs, $4 000; Commissioner of Education, $3,000; Commander of Marine Corps, $3,500; Supt. of Coast and Geodetic Survey, $6,000.

UNITED STATES TREASURY.—Treasurer, $6,000; Register of Treasury, $4,000; Comptroller of Customs, $4,000.

POST-OFFICE DEPARTMENT Washington. —Four Assistant Postmaster-Generals, $4,000: Chief Clerk, $2,500.

POSTMASTERS.—Postmasters are divided into four classes. First class, $3,000 to $4,000 (excepting New York City, which is $8,000); second class, $2,000 to $3,000; third class, $1,000 to $2,000; fourth class less than $1,000. The first three classes are appointed by the President, and confirmed by the Senate; those of fourth class are appointed by the Postmaster-General.

DIPLOMATIC APPOINTMENTS. — *Ambassadors*, at $17,500, to France, Great Britain, Germany, Mexico and Russia. *Envoys Extraordinary and Ministers Plenipotentiary*, at $12,000; to Austria-Hungary, Brazil, China, Italy, Japan and Spain; at $10,000 to Argentine Republic, Belgium, Chili, Columbia, Guatemala, Nicaragua, Peru, Netherlands, Turkey and Venezuela; at $7,500: to Denmark, Hayti, Paraguay and Uruguay, Portugal, Sweden and Norway, Switzerland; at $5,000: to Bolivia, Ecquador; at $6,500: to Greece. *Ministers Resident* at $7,500: Corea and Siam; at $5,000: Persia. Then four Consuls-Generals at $6,000, three at $5,000, six at $4,000, and eight at $3,500 to $2,000; also seventy-two Consuls at $1,000 up to $3,500.

ARMY OFFICERS.—General, $13,500; Lieut.-General, $11,000; Major-General, $7,500; Brigadier-General, $5,500; Colonel, $3,500; Lieut.-Colonel, $3,000; Major, $2,500; Captain, mounted, $2,000; Captain, not mounted, $1,800; Regimental Adjutant, $1,800; Regimental Quartermaster, $1,800; First Lieutenant, mounted, $1,600; First Lieutenant, not mounted, $1,500; Second Lieutenant, mounted, $1,50c; Second Lieutenant, not mounted, $1,400; Chaplain, $1,500.

NAVY OFFICERS.—Admiral, $13,500; Vice-Admiral, $9,000; Rear-Admirals, $6,000; Commodores, $5,000; Captains, $4,500; Commanders, $3,500; Lieut.-Commanders, $2,800; Lieutenants, $2,400; Masters, $1,800; Ensigns, $1,200; Midshipmen, $1,000; Cadet Midshipmen, $500; Mates, $900; Medical and Pay Directors and Medical and Pay Inspectors and Chief Engineers, $4,400; Fleet Surgeons, Fleet Paymasters, and Fleet Engineers, $4,400; Surgeons and Paymasters, $2,800; Chaplains, $2,500.

Popular and Electoral Votes for Presidents.

YEAR	CANDIDATES	PARTY	Popular Vote	Elec'l Vote
1832	Andrew Jackson	Democrat	687,502	219
1832	Henry Clay	Nat. Republican	530,189	49
1832	John Floyd	Whig		11
1832	William Wirt	Whig		7
1836	Martin Van Buren	Democrat	761,549	170
1836	W. H. Harrison	Whig	736,656	73
1836	Hugh L. White	Whig		26
1836	Daniel Webster	Whig		14
1836	W. P. Mangum	Whig		11
1840	Martin Van Buren	Democrat	1,128,702	48
1840	W. H. Harrison	Whig	1,275,017	234

YEAR	CANDIDATES	PARTY	Popular Vote	Elec'l Vote
1844	James K. Polk	Democrat	1,337,243	170
1844	Henry Clay	Whig	1,299,068	105
1848	Zachary Taylor	Whig	1,360,101	163
1848	Lewis Cass	Democrat	1,220,544	127
1848	Martin Van Buren	Free Soil	291,263	.....
1852	Franklin Pierce	Democrat	1,601,474	254
1852	Winfield Scott	Whig	1,386,578	42
1852	John P. Hale	Free Soil	156,149	.....
1856	James Buchanan	Democrat	1,838,169	174
1856	John C. Fremont	Republican	1,341,262	114
1856	Millard Fillmore	American	874,534	8
1860	Abraham Lincoln	Republican	1,866,352	180
1860	Stephen A. Douglas	Democrat	1,375,157	12
1860	John C. Breckenridge	Democrat	845,763	72
1860	John Bell	Union	589,581	39
1864	Abraham Lincoln	Republican	2,216,067	212
1864	George B. McClellan	Democrat	1,808,725	21
1868	U. S. Grant	Republican	3,015,071	214
1868	Horatio Seymour	Democrat	2,709,613	80
1872	U. S. Grant	Republican	3,597,070	286
1872	Horace Greely	Liberal and Dem.	2,834,079	.....
1872	James Black	Prohibition	5,608	.....
1876	R. B. Hayes	Republican	4,033,950	185
1876	Samuel J. Tilden	Democrat	4,284,885	184
1876	Peter Cooper	Greenback	81,740	.....
1876	G. C. Smith	Prohibition	9 522	.....
1880	James A. Garfield	Republican	4,449,053	214
1880	Winfield S. Hancock	Democrat	4,442,035	155
1880	James B. Weaver	Greenback	307,306	.....
1884	Grover Cleveland	Democrat	4,911,017	219
1884	James G. Blaine	Republican	4,848,334	182
1884	Benj. F. Butler	Greenback	133,825	.....
1884	John P. St. John	Prohibition	151,809	.....
1888	Benjamin Harrison	Republican	5,441,902	233
1888	Grover Cleveland	Democrat	5,538,560	168
1888	Fisk	Prohibition	249,937	.....
1888	Labor Vote		147,521	.....
1892	Grover Cleveland	Democrat	5,553,142	277
1892	Benjamin Harrison	Republican	5,186,931	145
1892	James B. Weaver	People's	1,030,128	22
1892	John Bidwell	Prohibitory	268,361	.....
1896	Wm. McKinley	Republican	7,107,980	271
1896	Wm. Jennings Bryan	Democrat	6,509,056	176
1896	John M. Palmer	Gold Democrat	132,056	.....
1896	Joshua Levering	Prohibition	127,174	.....
1896	C. H. Matchette	Socialist-Labor	36,426	.....
1900	Wm. McKinley	Republican	7,263,266	292
1900	Wm. Jennings Bryan	Democrat	6,415,887	155

Eleven Great Wonders in America.

Croton Aqueduct, in New York City.

City Park, Philadelphia, Pennsylvania. The largest park in the world.

Lake Superior. The largest lake in the world.

Mammoth Cave, in Kentucky.

Niagara Falls. A sheet of water three-quarters of a mile wide, with a fall of 175 feet.

Natural Bridge, over Cedar Creek, in Virginia.

New State Capitol, at Albany, N. Y.

New York and Brooklyn Bridge.

The Central Park, in New York City.

Washington Monument, Washington, D. C., 555 feet high.

Yosemite Valley, California; fifty-seven miles from Coulterville. A valley from eight to ten miles long, and about one mile wide. Has very steep slopes about 3,500 feet high; has a perpendicular precipice 3,089 feet high; a rock almost perpendicular, 3,270 feet high; and waterfalls from 700 to 1,000.

Noted American Trees.

The big tree of California.

"Old Liberty Elm," at Boston.

"The Burgoyne Elm," at Albany, N. Y.

The immense ash trees planted by General Washington at Mount Vernon, and now the admiration of visitors.

The weeping-willow over the grave of Cotton Mather in Cop's burying-ground, near Bunker Hill, taken from a tree that shaded the grave of Napoleon at St. Helena.

The Cary tree, planted by the roadside in 1832 by Alice and Phœbe Cary, is a large sycamore, standing on the turnpike from College Hill to Mount Pleasant, Hamilton County, Ohio.

The Washington elm still stands at Cambridge, Mass. It is on Garden street, a short distance from the colleges, and is a large, well-preserved tree. An iron fence is built around it, and on a stone in front is the following inscription: "Under this tree George Washington took command of the American Army, July 3, 1775."

The Great Famines of History.

Walford mentions 160 famines since the 11th century, namely: England, 57; Ireland, 34; Scotland, 12; France, 10; Germany, 11; Italy, etc., 36. The worst in modern times have been:

Country.	Date.	No. of Victims.
France	1770	48,000
Ireland	1847	1,029,000
India	1866	1,450,000

Deaths from hunger and want were recorded as follows in 1879, according to Mulhall: Ireland, 3,789; England, 312; London. 101; France, 260. The proportion per 1,000 deaths was, respectively, 37.6, .6, 1.2, .3.

Remarkable Plagues of Modern Times.

Date.	Place.	Deaths.	Weeks.	Deaths per Week.
1656	Naples	380,000	28	13,600
1665	London	68,800	33	2,100
1720	Marseilles	39,100	36	1,100
1771	Moscow	87,800	32	2,700
1778	Constantinople	170,000	18	9,500
1798	Cairo	88,000	25	3,500
1812	Constantinople	144,000	13	11,100
1834	Cairo	57,000	18	3,200
1835	Alexandria	14,900	17	900
1871	Buenos Ayres	26,300	11	2,400

Great Financial Panics.

The most remarkable crises since the beginning of the present century have been as follows:

1814. England, 240 banks suspended.
1825. Manchester, failures 2 millions.
1831. Calcutta, failures 15 millions.
1837. United States, "Wild-cat" crisis; all banks closed.
1839. Bank of England saved by Bank of France. Severe also in France, where 93 companies failed for 6 millions.
1844. England. State loans to merchants. Bank of England reformed.
1847. England, failures 20 millions; discount 13 per cent.
1857 United States, 7,200 houses failed for 111 millions.
1866 London, Overend-Gurney crisis; failures exceeded 100 millions.
1869. Black Friday in New York (Wall street), September 24th.
1873. Many banks failed, and great commercial enterprises where driven to the wall in the United States.
1893–95. The money question of a silver and gold, or the single gold standard was greatly agitated, and the United States passed through a financial crisis which wrecked thousands of business firms and brought on a disastrous financial stringency.

The Greatest Floods in History.

The Thames destroyed a great number of the inhabitants of its banks, nine years after Christ; another which destroyed all the inhabitants in Ferne Island, seven miles southwest from Holy Island, 323; 5,000 people lost in Cheshire by an eruption, 353; another of the Dee which drowned forty families, 415; an inundation of the sea in Norfolk, Suffolk, and Essex, 575; an inundation at Edinburgh, which did great damage, 730; an inundation at Glasgow, which drowned above 400 families, 738; an inundation of the Tweed, which did immense damage, 836; an inundation of the Medway, 861; an inundation at Southampton, which destroyed many people, 935; an inundation of the Severn, which drowned hundreds of cattle, 1046; the sea overflowed 4,000 acres of Earl Godwin's land, in Kent, since called Godwin Sands, 1100; a great part of Flanders overflowed by the sea, 1108; an inundation of the Thames for above six miles at Lambeth, 1243; another, since named the Dollert Sea, 1277; at Winchelsea 300 houses were overthrown by the sea, 1280; 120 laymen, and several priests, besides women, were drowned by an inundation at Newcastle-upon-Tyne, 1339; at the Texel, which first raised the commerce of Amsterdam, 1400; the sea broke in at Dort, and drowned 72 villages and 100,000 people, and formed the Zuyder Sea, 1421; in 1530 the Holland dykes broke, 400,000 lost; in February, 1735, at Dagenham, and upon the coast of Essex, which carried away the sea walls, and drowned several thousand sheep and black cattle; in Spain, and did 3,000,000 livres damage, at Bilboa, April, 1762; at Naples, where it carried away a whole village, and drowned 200 of the inhabitants, November 10, 1773; in Spain, Navarre, September, 1787, where 2,000 lost their lives, all the buildings of several villages carried away by the currents from the mountains; a terrible inundation by the Liffey, in Ireland, which did very considerable damage in Dublin and its environs, November 12, 1787; at Kirkwald, in Scotland, by breaking the Dam-dykes, October 4, 1788, which nearly destroyed the town; almost throughout England by the melting of the snow, and the greater part of the bridges were either destroyed or damaged, February, 1795; at St. Domingo, which destroyed 1,400 persons, October, 1800; on the coast of Holland and Germany, November, 1801; in Dublin and parts adjacent, December 2 and 3, 1802

The Johnstown Flood, in June, 1889, at Johnstown, Pa., was caused by the breaking of a dam on the upper waters of the Conemaugh River, which confined a great lake on top of the Alleghany Mountains. The flood swept down the valley faster than a railroad train in speed. Several small towns and the city of Johnstown were swept away, and 6,111 persons perished.

The Galveston Flood. — In September, 1900, a hurricane along the southern coast of the United States reached the climax of its fury near Galveston, Texas, at 1 o'clock

at night, literally blowing the Gulf waters over the island on which Galveston is situated, causing a loss of life and property unparalleled by any similar disaster in the United States. The city of Galveston was well-nigh annihilated, 7,000 lives being lost, and $30,000,000 worth of property destroyed in the city and near by on the mainland. This appears the more frightful in view of the fact that less than 40,000 souls inhabited Galveston. Thousands escaped by clinging to the wreckage of houses and ships which the wind blew far inland on the high tide. About $1,000,000 was subscribed for relief throughout the country, and the rebuilding of the city was begun promptly after the ruins were sufficiently cleared away.

The Greatest World's Fairs.

WHERE HELD	Year.	Area Covered.*	Exhibitors	Visitors.†	Days Open.	Receipts‡
		Acres.				
London	1851	21	13,937	6,039,195	141	$1,750,000
Paris	1855	24½	21,839	5,162,330	200	644,100
London	1862	23½	28,653	6,211,103	171	1,614,240
Paris	1867	37	50,226	8,805,569	217	2,103,675
Vienna	1873	40	50,000	6,740,500	186	1,162,385
Philadelphia	1876	60	30,864	10,164,489	159	3,813,724
Paris	1878	60	40,366	16,032,725	194	2,531,650
Sydney	1879	26	9,345	1,117,536	210	200,000
Melbourne	1880	.....	.....	1,330,279	210	.....
Fisheries Exhibition, London	1883	9	3,000	2,708,051	147	585,000
Health Exhibition, London	1884	.....	.....	4,158,390	151	892,545
Inventions Exhibition, London	1885	.....	.....	3,760,581	163	750,000
Colonial and Inland, London	1886	13	.....	5,550,745	164	1,025,000
Glasgow	1888	.....	.....	5,748,379	161	560,330
Paris	1889	75½	55,000	28,149,253	185	8,300,000
Chicago	1893	633	.....	27,539,521	181	14,000,000
Paris	1900	.....	75,50:	50,000,000	212	.....
Buffalo	1901					

* Buildings and covered structures.

† The largest number of visitors in any one day was 400,000 in 1889 in Paris, and 716,881 in Chicago in 1893, and 600,000 in Paris in 1900. It will be noticed that the Paris Exposition of 1900 admitted the largest number of paying visitors—50,000,000—ever attending any exposition, almost doubling the total number of paying visitors attending the Chicago Exposition.

The Highest Buildings, Monuments, etc.

	Feet.
Eiffel Tower, Paris	989
Washington Monument	555
City Hall, Philadelphia, Pa.	548
Pyramid, Cheops, Egypt	543
Cathedral, Cologne	511
" Antwerp	476
" Strassburg	474
Tower, Utrecht	464
Steeple, St. Stephen's, Vienna	460
Pyramid, Khafras, Egypt	456
St. Martin's Church, Bavaria	456
Chimney, Port Dundas, Glasgow	454
St. Peter's, Rome	448
Notre Dame, Amiens	422
Salisbury Spire, England	406
Cathedral, Florence	380
" Cremona	372
" Freiburg	367
St. Paul's, London	365
Cathedral, Seville	360
Pyramid, Sakkarah, Egypt	356
Cathedral, Milan	355
Notre Dame, Munich	348
Invalides, Paris	347
Parliament House, London	340
Cathedral, Magdeburg	337
St. Patrick's New York	328
St. Mark's, Venice	328
Statue of Liberty, New York	321
Cathedral, Bologna	306
" Norwich, Eng.	309
" Chichester, Eng.	300
" Lincoln, Eng.	300
St. James' Cathedral, Toronto	316
Capitol, Washington	300
Trinity Church, New York	283
Cathedral, Mexico	280
" Montreal	280
Campanile Tower, Florence	276
Column, Delhi	260
Cathedral, Dantzic	250
Porcelain Tower, Nankin	248
Custom House, St. Louis	240
Canterbury Tower, England	235
Notre Dame, Paris	232
Chicago Board of Trade	230
St. Patrick's, Dublin	226
Cathedral, Glasgow	225
Bunker Hill Monument	220
Notre Dame, Montreal	220
Cathedral, Lima	220
" Rheims	220
" Garden City, L. I.	219
St. Peter and Paul, Philadelphia, Pa.	210
Washington Monument, Baltimore	210

Famous Giants and Dwarfs.

The most noted giants of ancient and modern times are as follows:

Name.	Place.	Height, Feet.	Period.
Goliath	Palestine	11.0	B. C. 1063.
Galbara	Rome	9.9	Claudius Cæsar.
John Middleton,	England	9.3	A. D. 1578.

Name	Place.	Height, Feet.	Period.
Frederick Swede,	Sweden	8.4	. . . . .
Cajanus	Finland .	7.9	. . . . .
Gilly	Tyrol . .	8.1	. . . . .
Patrick Cotter .	Cork . .	8.7	1806.
Chang Gow . .	Pekin . .	7.8	1880.

Many of the great men of history have been rather small in stature. Napoleon was only about five feet four inches, Washington was five feet seven inches. One of the greatest of American statesmen, Alexander H. Stephens, never excelled 115 pounds in weight, and in his old age his weight was less than 100 pounds.

The more notable human mites are named below:

Name.	Height, inches.	Date of Birth.	Place of Birth.
Count Borowlaski	39	1739	Warsaw.
Tom Thumb (Chas. S. Stratton) . . .	31	1837	New York.
Mrs. Tom Thumb .	32	1842	"
Che-Mah	25	1838	China.
Lucia Zarate . . .	20	1863	Mexico.
General Mite . . .	21	1864	New York.

Remarkable Genius in Youth.

Handel had produced an opera before he was fifteen.

Corneille had planned a tragedy before he was ten.

Auber wrote an operetta for the stage before he was fourteen.

Pitt was Chancellor of the Exchequer before he was twenty-five.

Schiller was widely known as a poet before the age of twenty.

Kaulbach at seventeen was pronounced the first artistic genius in Germany.

Kant began his philosophical and metaphysical speculations before the age of eighteen.

Goethe had produced a considerable number of poems and several dramas before he was twenty.

Raphael showed his artistic abilities at the early age of twelve, when he was widely known as an artist in oil.

Remarkable Memories.

Magliabechi, of Florence, called "The Universal Index and Living Cyclopædia" (1633–1714).

P. J. Beronicius, the Greek and Latin improvisator, who knew by heart Horace, Virgil, Cicero, Juvenal, both the Plinys, Homer, and Aristophanes. He died at Middleburgh, in 1676.

Andrew Fuller, after hearing 500 lines twice, could repeat them without a mistake. He could also repeat *verbatim* a sermon or speech; could tell either backward or forward every shop sign from the Temple to the extreme end of Cheapside, and the articles displayed in each of the shops.

Woodfall could carry in his head a debate, and repeat it a fortnight afterward.

Thompson could repeat the names, trades, and particulars of every shop from Ludgate Hill to Piccadilly.

William Radcliff, the husband of the novelist, could repeat a debate the next morning.

Blind Tom, the famous negro pianist, could repeat any speech he heard uttered. He could also play any piece of music from memory after once hearing it. In some respects his mind was very weak.

At the Palmer House, Chicago, is a colored man who stands at the door of the dining-room and receives the hats, coats, and umbrellas of the hundreds of guests who go in to each meal. As they come out, he, without error, hands each guest the articles intrusted to him on entering. In many years' service it is declared he has not made a dozen errors. In view of the fact that he gives no checks, but depends entirely on his memory of faces, and must associate the articles with the individual leaving them, and that he must thus deal with hundreds of strangers every day, and has kept it up daily for many years, his feat of memory is one of the most remarkable on record.

INTERESTING HISTORICAL FACTS

"Uncle Sam," Origin of the Name.

Speculation has arisen regarding the origin of the term "Uncle Sam" as applied to the United States Government.

In the war of 1812, between this country and Great Britain, Elbert Anderson, of New York, purchased in Troy, N. Y., a large amount of pork for the American army.

It was inspected by Samuel Wilson, who was popularly known as "Uncle Sam." The barrels of pork were marked "E. A., U. S.," the lettering being done by a facetious employee of Mr. Wilson.

When asked by fellow-workmen the meaning of the mark (for the letters U. S., for United States, were then almost entirely new to them), he said "he did not know, unless it meant Elbert Anderson and Uncle Sam," alluding to Sam Wilson.

The joke took among the workmen, and passed currently, and "Uncle Sam" himself being present, was occasionally rallied on the increasing extent of his possessions. Soon the incident appeared in print, and the joke gained favor rapidly, till it penetrated and was recognized in every part of the country, and will, no doubt, continue so while the United States remains a nation.

"John Bull," Origin Of.

The term John Bull, is a satirical personification of the English people, derived from Arbuthnot's "History of John Bull," in which satirical story the hero was represented as a bluff, kindhearted but bullheaded English farmer, associated with two other characters, Lewis Baboon, representing the Frenchman, and Nicholas Frog, representing the German. John Bull was accepted by the world as a typical Englishman, and hence, to Dr. Arbuthnot belongs the honor of inventing the national nickname, first applied to England, but later extending to the people of the whole British Empire.

Important Battles in History.

The Battle of Actium, B.C. 31, in which the combined fleets of Antony and Cleopatra were defeated by Octavius, and imperialism established in the person of Octavius.

The Battle of Arbela, B.C., 331, in which the Persians, under Darius, were defeated by the Macedonians and Greeks under Alexander the Great.

The Battle of Marathon, B.C. 490, in which the Athenians, under Miltiades, defeated the Persians, under Datis.

The Battle of Syracuse, B.C. 413, in which the Athenians were defeated by the Syracusans and their allies.

The Battle of Metaurus, B.C. 207, in which the Carthaginians, under Hasdrubal, were defeated by the Romans, under the Consuls, Caius Claudius Nero and Marcus Livius.

The Battle of Philippi, B.C. 42, in which Brutus and Cassius were defeated by Octavius and Antony. The fate of the Republic was decided.

The Battle of Blenheim, A.D. 1704, in which the French and Bavarians, under Marshal Tallard, were defeated by the English and their allies, under Marlborough.

The Battle of Chalons, A.D. 451, in which the Huns under Attila, called the "Scourge of God," were defeated by the confederate armies of Romans and Visigoths.

Battle of Hastings, A.D. 1066, in which Harold, commanding the English army, was defeated by William the Conqueror of Normandy.

The Battle of Lutzen, A.D. 1632, which opened the way to religious liberty in Germany. Gustavus Adolphus was killed.

The Battle of Pultowa, A.D. 1709, in which Charles XII. of Sweden, was defeated by the Russians, under Peter the Great.

The Battle of Tours, A.D. 732, in which the Saracens were defeated by Charles Martel. Christendom was rescued from Islam.

On the 21st of October, 1805, the great naval battle of Trafalgar was fought. The English defeated the French and destroyed the hopes of Napoleon as to a successful invasion of England.

The Battle of Valmy, A.D. 1792, in which an invading army of Prussians, Austrians and Hessians, under the command of the Duke of Brunswick, were defeated by the French, under Dumouriez.

The three days' battle of Leipzig 1813 where Napoleon I. was defeated by the allied armies of Prussia, Russia and Sweden.

The Battle of Waterloo, 1815, in which the French, under Napoleon, were defeated by the allied armies of England, under the Duke of Wellington, and of Prussia, under Prince Blucher.

The Battle of Gettysburg, in 1863, has been styled the "Waterloo of the Confederacy." It was the greatest battle of the Civil War, the Union side losing 23,001 and the Confederates 20,448, in killed, wounded and missing.

The battles around Metz August 14, 16, 18, 1870. Bazaine, with 200,000 men, was thrown into the fortress by the Germans.

The Battle of Sedan, September 2, 1870. Napoleon III., with 80,000 men, surrendered to the allied Germans.

The naval battle in Manila Bay, May 1, 1898. The American squadron, under Dewey, annihilated the Spanish fleet under Montijo.

The Battle of Omdurman, September 3, 1898. English-Egyptian army, under Kitchener, routed large army of dervishes under Khalifa Abdullah.

The battle of Santiago, in July 1898, in which the Spanish Army and Navy were defeated by the Americans, resulting in the treaty of peace, whereby Spain lost all her possessions in the East and West Indies.

Famous Sieges—Time they Continued.

The siege of Khartoum lasted 341 days; that of Sebastopol 329 days; Mafeking, South Africa, 1899, 216 days; Paris 167 days; Kimberly 123 days; Plevna 94 days Lucknow 62 days, and Cawnpore 21 days.

The Greatest Number of Men Ever Killed in a Single Battle.

Sulla destroyed 300,000 men in each of three battles, one being at Cheronea. The Persians are said to have lost 230,000 at Platæa. Second Chronicles xiii. 17, records 500,000 slain on one side, which may not have been in one battle. First Kings xx. 29, gives 100,000 on one side destroyed in one day. Many historians pay little attention to statistics of losses, but look for the influence of the conflict, and such as give figures often caution us regarding the unreliability of the number which they mention as being killed in remote times.

Historical Massacres.

Great massacres occurred at the places and on the dates named below.

Of all the Carthaginians in Sicily, 397 before Christ. Two thousand Tyrians crucified, and 8,000 put to the sword, for not surrendering Tyre to Alexander, 331 B.C. The Jews of Antioch fall upon the other inhabitants, and massacre 100,000, for refusing to surrender their arms to Demetrius Nicanor, tyrant of Syria, 154. A dreadful slaughter of the Teutones and Ambrones, near Aix, by Marius, the Roman general, 200,000 being left dead on the spot, 102. The Romans throughout Asia, women and children not excepted, cruelly massacred in one day, by order of Mithridates, King of Pontus, 89. A great number of Roman senators massacred by Cinna, Marius, and Sertorius, and several of the Patricians despatched themselves to avoid their horrid butcheries, 86. Again, under Sulla, and Catiline, his minister of vengeance, 79 and 82. At Præneste Octavianus Cæsar ordered 300 Roman senators, and other persons of distinction, to be sacrificed to the manes of Julius Cæsar, 41. At the destruction of Jerusalem 1,000,000 Jews were put to the sword, A.D. 70. Cassius, a Roman general, under the Emperor M. Aurelius, put to death 37,000 of the inhabitants of Seleucia, 197. At Alexandria, of many thousand citizens, by order of Antoninus, 213. The Emperor

Probus put to death 700,000 of the inhabitants upon his reduction of Gaul, 277. Of eighty Christian fathers, by order of the Emperor Gratian, at Nicomedia; they were put into a ship which was set on fire and driven out to sea, 370. Of Thessalonica, when upward of 7,000 persons, invited into the circus, were put to the sword by order of Theodosius, 390. Belisarius put to death above 30,000 citizens of Constantinople for a revolt, on account of two rapacious ministers set over them by Justinian, 532. Of the Latins, by Andronicus, 1184 (at Constantinople). The Sicilians massacred the French throughout the whole island, without distinction of sex or age, on Easter Day, the first bell for vespers being the signal; this horrid affair is known in history by the name of the Sicilian Vespers, 1282. At Paris, 1418. Of the Swedish nobility, at a feast, by order of Christian II., 1520. Of 70,000 Huguenots, or French protestants, throughout the kingdom of France, attended with circumstances of the most horrid treachery and cruelty; it began at Paris, in the night of the festival of St. Bartholomew, August 25, 1572, by secret orders from Charles IX., King of France, at the instigation of the queen dowager, Catharine de Medicis, his mother; it is styled in history the massacre of St. Bartholomew. Of the Christians, in Croatia, by the Turks, when 65,000 were slain, 1592. Of a great number of protestants at Thorn, who were put to death under a pretended legal sentence of the Chancellor of Poland, for being concerned in a tumult occasioned by a popish procession, 1724. At Batavia, where 12,000 Chinese were killed by the natives, October, 1740. In England, 300 English nobles, by Hengist, A.D. 475. Of the monks of Bangor, 1,200; by Ethelfrid, King of Northumberland, 580. Of the Danes, in the southern counties of England, in the night of November 13, 1002, and the 23d Ethelred II.; at London it was the most bloody, the churches being no sanctuary; among the rest, Gunilda, sister of Swen, King of Denmark, left in hostage for the performance of a treaty but newly concluded. Of the Jews, some few pressing into Westminster Hall, at Richard I.'s coronation, were put to death by the people, and a false alarm being given that the king had ordered a general massacre of them, the people in many parts of England, from an aversion to them, slew all they met; in York 500, who had taken shelter in the castle, killed themselves rather than fall into the hands of the people, 1189. Of the English, by the Dutch at Amboyna, 1624. Of the protestants in Ireland, when 40,000 were killed, 1641. Of the Macdonalds at Glencoe, in Scotland, for not surrendering in time according to King William's proclamation, though without the king's knowledge, 1692. Several dreadful massacres in France during the Revolution, from 1789 to 1794.

The Monroe Doctrine and the Venezuela Boundary Controversy.

No document has issued from the White House at Washington, since Lincoln's famous Proclamation of Emancipation of September, 1862, that has created such world-wide interest as the message sent to Congress by President Cleveland on the 17th of December, 1895, calling attention to the controversy between Great Britain and the Republic of Venezuela concerning the boundary lines dividing Venezuelan and British territory. The British claims concerning the extent of the colony of British Guiana were resented by the Republic of Venezuela. As a matter of fact, the boundary lines of this republic have never been definitely fixed. The total area claimed by Venezuela is 632,807 square miles, but of this only 439,000 square miles are actually under Venezuelan administration.

Taking his stand firmly on the Monroe Doctrine as a recognized element of international law, the President asked the British Government to submit the whole matter to arbitration. This being refused, the United States Congress unanimously passed a bill on the 20th of December, 1895, authorizing the President to appoint a commission to "Investigate and report on the true divisional line between the Republic of Venezuela and British Guiana."

The bill based on the President's Message passed the House and the Senate in about forty-eight hours. Never was a law passed so rapidly, nor supported with such enthusiastic patriotism. $100,000 was appropriated for the expenses of said commission.

SOME WONDERFUL THINGS IN NATURE

Mammoth Cave.

This is the largest known cave in the world. It is in Edmonson County, Kentucky, on the left bank of Green River. It consists of a series of caverns, and has been explored to a distance of ten miles. In this cavern is Echo River, which is crossed by a boat. Plenty of fish are found in the river, but the creatures are without eyes, there being not the least gleam of light within the cave, and hence no need of eyes. A voyage of a few hundred yards on Echo River, which winds and branches through the gloomy expanse, takes the visitor into a fairy land of labyrinths, flashing in the light of the torches, and with stalactites and stalagmites of every conceivable shape. Throughout its whole length the cave seems a mystery of buried palaces and magic haunts, not equaled in any other portion of the globe. Among other wonderful features are the Deserted Chambers, containing many deep and dangerous pits, the more frightful for the chaos of darkness that enwraps them; also the Side-saddle Pit, and the Covered Pit, the latter 15 feet in diameter, and nearly covered by a thin plate of rock. By putting the ear to the edge, the sound of falling water is heard in the fathomless depths below. Mammoth Dome is one of the special wonders of the place. The roof is 300 feet high. Solitary Cave is an awfully grand and silent chamber. Bottomless Pit and the River Lethe are also important features. All through the cave are found groups of curious and interesting figures, sculptured by the action of the water among the rocks in past infinite ages. The temperature of the cave is always 59 degrees F., and the place has been strongly recommended for some diseases. A few years ago a party of consumptives took up their abode within the cave. In a short time a portion of them died, and the rest lived only a few days after coming out. From dwelling in darkness so long, it is said that the pupils of their eyes had expanded until the iris had become invisible.

Luray Caverns.

These marvelous subterranean caverns in Virginia bear numerous evidences of having been frequented by a prehistoric race; but whether they were Norsemen or Red Men, we have not sufficient means for determining, although many bones, and recently one whole skeleton of a male person, which may eventually throw some light upon the subject, have been discovered. The interior of many of the chambers are lined with smoke, and large patches of the stalagmites have been removed from the floor to make it smooth and more easily used. But everything indicates that a long, long period of time—perhaps many thousands of years—have elapsed since voices resounded through those silent halls. The cave abounds in singular and interesting objects, deposited from the dripping waters. One stalagmite called the Empress Column, is a pure white mass of alabaster, 70 feet high, reaching to the roof. Another pendant formation, nearly equal to the Empress Column in length, vibrates for a moment on being struck, and one of the rooms, termed the Cathedral, has a series of twenty slender columns, which sound part of a scale on being struck successively. This is called the organ.

Fingal's Cave.

Who does not remember to have seen crude pictures of it in the old school geographies? and still the interest with which it has always been regarded, continues unbroken. This famous natural grotto is on the Island of Staffa, on the southwest coast of Scotland. It is a cave of the sea. The formation consists of lofty basaltic columns, which look as if they might have

been chiseled by the hand of man, in countless ages of patient toil, and fashioned and placed as here we see them. The cave extends inward from the shore line about 225 feet, and in low water is lighted from without throughout its whole length. At the mouth it has a breadth of 42 feet, which diminishes to 22 feet at the extreme end. The entrance describes an almost perfect Gothic arch, and the columns which form the sides are of enormous size. Between the numberless pillars are stalactites of wonderful beauty.

A Magnetic Cave.

A California correspondent thus speaks of the cave which has recently been discovered in that State, the walls of which contain loadstones:

As we entered the chamber, which is lined with a brownish black ore, all the party were more or less affected in a peculiar way, which some described as a chill along the spinal column, but which seemed to me more like the "aura" one feels when he brings his face into close proximity to an electric machine in vigorous action. There was—at least so it seemed to me—a slight odor of ozone in the air, which, considering the current theory of the close connection of magnetism with electricity, might have been expected. In walking along the slippery floor of the cavern I struck with my foot a small oblong rock in such a way as completely to overturn it, bringing its south pole where its north had been in contact with the north pole of another. It was immediately repelled—rebounded—to a distance of several feet, with considerable force, but it must be remembered that the floor was slippery with ooze, which had all the effect of oil. One of the party had taken a gun into the cave, which, of course, he carried with its muzzle toward the floor. Its ramrod was withdrawn by the magnetic force, and, to the surprise of us all, stood upright on the ground. When struck on one side it would fall over to the other, but instantly snap back; but it was easily taken up and replaced in position. The watches of all the party were found, on emerging from the cave, to have stopped while in it. A knife tossed to the roof remained fixed there. An experiment which I afterward wished I had tried would have been to feel the pulses of the party to see what effect, if any, the peculiarity of the situation had on the human body.

The Largest Cavern in the World.

Some years ago at the Hartford meeting of the American Association for the Advancement of Science, Mr. Porter C. Bliss, Secretary of the Legation in Mexico, gave a description of the Cave of Cacahuamilpa, which, according to his statement, is the largest cavern in the world. It includes a series of broad and lofty halls, with lateral passages, extending upon the same level an immense distance into the heart of a lofty range of mountains. The halls abound in colossal stalactites and stalagmites, of every conceivable and grotesque and fanciful form. At a depth of two or three hundred feet beneath the cave, the mountain is penetrated by two rivers of considerable size, which, at their entrance, are about half a mile apart, and, after flowing a distance, by direct measurement, of five miles, emerge from the mountain in close proximity, and thence united form one of the chief affluents of the Mexicola. The channels in the solid rock through which these rivers emerge are said by Mr. Bliss to be large enough to admit the Hartford State House. Fragments of timber and debris are often floated through the mountain, but these subterranean river beds have never been explored. Myriads of bats and nocturnal birds seek shelter or make their abode in the mouth of the cave.

In the Maelstrom of Niagara.

The following is a description of Captain Webb's fatal attempt to swim through the rapids and whirlpool, at Niagara, in July, 1883: Webb promptly removed his hat, handkerchief, coat, and all his clothing save a pair of short red cotton trunks around his loins, and, without a word of farewell, plunged boldly in the water at a point opposite the Maid of the Mist landing. A moment later, he rose gracefully to the surface, and, swimming with infinite ease and power, struck boldly out. He cleared the water with strong and steady strokes, swimming on his breast, with his head clear from the surface. He kept in the center of the stream, and the strong eddies which occasionally

swirled past him seemed in no way to impede or swerve him from his course. As he approached the old suspension bridge, the flow of the current increased with remarkable rapidity. There were about two hundred spectators on the bridge who saw the intrepid swimmer glide toward them, pass swiftly beneath, and ere they could reach the east side of the structure, he was fifty yards down the current. He was carried along as fast as the eye could follow him. With speechless wonder and fear he was seen to reach the first furious billows of the rapids. Onward he was swept like a feather in the sea. High on the crest of a huge boulder of water, his head and shoulders gleamed for an instant, and then were lost in a dark abyss of turmoiling water. Again he appeared, his arms steadily moving, as if balancing himself for a plunge into another mighty wave. The tumbling, rushing, swirling element seemed to give forth an angry, sullen roar, as if sounding the death-knell of the ill-fated swimmer. Once more away down the rapids he was seen, still apparently braving fate, and stemming the seething waters with marvelous skill and endurance. Instead of being hurled hither and thither, as might have been expected, he was carried with furious rapidity onward, almost in a straight course. For nearly a mile he was hurried forward by the tumultuous rushing waters, and still he seemed to be riding the awful billows in safety. In four minutes after he had passed under the old suspension bridge he had been hurried through the terrible rapids, and arrived at the mouth of the great whirlpool. Reaching what seemed to be less troubled and dangerous waters, he raised his head well above the surface, gazed for an instant toward the American shore, and then turned his face to the high bluff on the Canadian side. A second later he dived or sank, and was seen no more.

The "Maid of the Mist" through the Rapids.

The fatal attempt in 1883, of the daring swimmer, Captain Webb to swim the rapids and whirlpool, below Niagara Falls, calls to mind the memorable passage of the steamer *Maid of the Mist* in 1861, over this same dangerous voyage, it being the only occasion when a human being effected the passage in safety. The steamer had been sold to parties at Lewiston, on condition that she be delivered at that place. Mr. George W. Holley gives the rest of the story:

"About 3 o'clock in the afternoon of June 15, 1861, the engineer took his place in the hold, and, knowing that their flitting would be short at the longest, set his steam-valve at the proper gauge, and waited—not without anxiety—the tinkling signal that should start them on their flying voyage. McIntyre joined Robinson at the wheel, on the upper deck. Robinson took his place at the wheel and pulled the starting bell. With a shriek from her whistle, and a white puff from her escape-pipe, the boat ran up the eddy a short distance, then swung around to the right, cleared the smooth water, and shot like an arrow into the rapid under the bridge. She took the outside curve of the rapid, and when a third of the way down it, a jet of water struck against her rudder, a column dashed up under her starboard side, heeled her over, carried away her smoke-stack, started her overhang on that side, threw Robinson on his back, and thrust McIntyre against her starboard wheel house with such force as to break it through. Every looker-on breathed freer as she emerged, shook her wounded sides, slid into the whirlpool, and for a moment rode again on an even keel. Robinson rose at once, seized the helm, set her to the right of the large pot in the pool, then turned her directly through the neck of it. Thence, after receiving another drenching from its waves, she dashed on without further accident, to the quiet bosom of the river below Lewiston.

SOME WONDERFUL WORKS OF MAN

The Ingenuity of Man.

Man is the ingenious animal who makes things. He has reason, which, philosophers tell us, no other animal has: thought, reason, logic are the overseers of his powers. He looks about him and sees the products of nature and he thinks how he may turn them to his own use, comfort, pleasure, service. But all this would avail him little more than it does other animals, did he not possess an instrument which other animals have not—*the hand*. How partial Providence was in giving man a hand! It is the one physical mark of his divine origin and kinship. God is the maker of all natural things. "The heavens declare the glory of God and the firmament showeth His handiwork." Man is the maker of nearly all artificial things. There is scarcely any natural force or thing on the earth that man has not already put his hand upon and transformed and fashioned it into a thousand things and shapes of use and beauty for his kind. The ancients built the Tower of Babel to their utter confusion; but the ingenuity of modern man is building high upon the battlements of a nobler tower that shall lift him eventually into the very courts of God.

SHEPPARD.

The Seven Wonders of the World.

Of course, in a book like this, it would not be proper to omit mention of what in all recent ages have been mentioned as the Seven Wonders of the World. These were:

1. Pyramids of Egypt, of which it may be said of Cheops, the largest of them all, that it is 764 feet square at the base, and, including 20 feet at the apex that have been removed, is 500 feet high. (The tower of the City Hall at Philadelphia believed to be the highest tower in the world, is 547 feet.) The pyramid contains 90,000,000 cubic feet of masonry, and covers an area of over 13 acres, being larger than Madison Square, New York, and *twice the height of Trinity Church spire*. There is enough material in this pyramid, says the author of "Buried Cities," to build a city as large as Washington, including all its public buildings. Herodotus tells us 400,000 men were employed twenty years in building it. It was the tomb of kings.

2. The beautiful and immense Mausoleum which Artemisia erected in Halicarnassus to the memory of her husband, Mausolus, king of Caria. Concerning the tomb itself we know not much, but of Artemisia and of her excessive love for her husband, many stories are told, one of which is that her grief for his death was so great that she mixed his ashes with water and drank them off.

3. The Temple of Diana, at Ephesus, the building of which occupied 220 years. The whole length of the temple was 425 feet, and the breadth 220 feet, with 127 columns of the Ionic order, in Parian marble, each a single shaft 60 feet high, and the gift of a king.

4. The Walls and Hanging Gardens of Babylon. The walls were 337 feet 8 inches high and 84 feet 6 inches broad. Inside the outer walls was a second of equal height. The famous hanging gardens were 400 feet square. They were carried up on arches above arches until the height equaled that of the city walls. On the top the soil was made so deep that large trees could take root in it.

5. The Colossus at Rhodes, a celebrated brazen image. It was twelve years in building, and was so large that it is popularly considered to have stood beside the mouth of the harbor, and that ships sailed between its feet. This, however, is doubtful. There were few persons who could

reach round the thumb with both arms, and its fingers were larger than most statues. The cost was about $317,000.

6. The Statue of Jupiter Olympus. This was by the famous sculptor Phidias. The god was represented as seated on his throne of gold, ebony, and ivory, and the figure was itself of ivory and gold; and, though seated, yet of such vast proportions it almost reached the ceiling of the temple, which was 68 feet high.

7. The Pharos, a lighthouse 550 feet high, at Alexandria, Egypt. Its light could be seen 100 miles out at sea. This tower was designed as a memorial of the King Ptolemy, who ordered his name to be inscribed on the pediment. The story goes that the architect, however, first cut his own name in the marble, placing over it, in stucco, the name of the king. In a few years the name of the king was worn away, leaving that of Sostratus, the architect, to blaze forever on the front of the unrivaled monument. And yet, not forever, as no vestige of the monument has for ages been visible.

Pearls and Pearl Divers.

The most important pearl fisheries are in the Persian Gulf, off the Arabian coast, in the Bay of Bengal, near Ceylon, and in other parts of the Indian Ocean. Previous to 1795 most of the Indian fisheries were in the hands of the Dutch, but they became British after the treaty of Amiens in 1802. The Ceylon fisheries are sometimes undertaken by the Government, and sometimes they are let to a contractor. Before the commencement of the season a government inspection of the coast takes place, in order that the banks may not be impoverished by too frequent fishing. The fishing for the pintadines in the Gulf of Menaar, a large bay on the northeast coast of the island of Ceylon, commences in February or in March, and continues thirty days. Upon this ground 250 boats are occupied, which come from different parts of the coast. At 10 o'clock at night, at the sound of a signal gun, they put to sea, and, as soon as the dawn furnishes them with sufficient light, they commence their day's labor. Each boat is manned by ten rowers, and ten divers occupy the deck, which covers half the vessel. Five of the divers rest while the others are gathering the pintadines, and each boat's crew is attended by a negro, who makes himself generally useful. The divers descend usually about forty feet, and the best of them can keep under the water one and a half minutes. To accelerate their descent they attach to their foot a stone of the shape of a sugar-loaf, which weighs about fifty pounds. Arriving at the fishing-ground, a diving-stage, which projects over the side of the boat, is made by lashing the oars to each other. To the edge of this stage the diving-stones are hung. When a diver descends, he places his right foot in a stirrup, which is attached to the conical point of the stone, or he holds the cord which suspends the stone to the boat between his toes; with the other foot he carries a net in which the shells are to be placed, then, seizing in his right hand a signal-cord, conveniently arranged for this purpose, and, tightly closing his nostrils with his left hand, he plunges, holding himself vertically over the sinking stone. Lest his descent should be in the slightest degree impeded, the diver is naked, with the exception of a piece of calico round his loins. Upon reaching the bottom he withdraws his foot from his stirrup, and the stone is at once drawn to the top, ready for the use of another diver. He then throws himself upon his face on the ground, and, stretching out his arms, he gathers all the mullusks within his reach and places them within his net. When he wishes to ascend he pulls the signal cord sharply and is rapidly drawn up. There is always one stone for two divers; one rests and refreshes himself while the other is in the water. The time the divers ordinarily keep beneath the surface is thirty seconds, and, in favorable circumstances, they can make fifteen or twenty descents in succession. But sometimes they are unable to go down more than three or four times. Even then, when they come up, water colored with blood comes from their mouths, noses and ears. The work is very distressing and makes sad havoc of the constitution; the pearl-divers never reach old age. The fishing is continued until noon, when a second gun gives the signal to cease. The owners of the boats wait on the shore to superintend the discharge of the cargoes, which

must be all secured before night, to prevent robbery. Formerly the Ceylon fisheries were very productive. In 1797 they yielded £144,000, and in the following year as much as £192,000. In 1802 the banks were let for £120,000, but ever since they have been less and less valuable, and now are not worth more than £20,000 per annum or less than £100,000.

SOME OF THE GIANT PEARLS.

Of course there are giants among the pearls, whose size and value render them historical. Julius Cæsar, who was a great admirer of pearls, gave one to Servilia, which was valued at a million sesterses, about $43,000 of our money! Cleopatra had two famous pearls, one of which the capricious queen dissolved in vinegar and drank the precious draught—a cup of acid wine worth $275,000. The other pearl was split in two, and each half became an earring in the statue of the Capitoline Venus. If it be true, the highest price ever given for a pearl was $850,000, with which sum the Shah of Persia is said to have bought one from Taverner, which that traveler had purchased at Califa. In 1759 one of the earliest transactions of this nature is recorded. A pearl from Panama, worth $18,000, was brought to Philip II., king of Spain. The Prince of Muscat possessed one fished up from his waters, which was not large, but so transparent that he refused for it the same sum. In the Zozema Museum at Moscow, there is a pearl called the "Pilgrim," which is quite semi-lucent; it is globular in form, and weighs nearly an ounce. The Shah of Persia possesses a string of pearls, each of which is as large as a hazel-nut; the price of the string is inestimable! At the Paris Exhibition in 1855, Her Majesty, the Queen of England, exhibited some magnificent pearls; and the Emperor also contributed 408 of the finest water; their value was more than $85,000. Pearls have always been held in the highest estimation by the eastern nations; indeed, they invested large pearls with magnificent powers, and believed that their possession exercised a mystic influence, guiding their fortunes, and preserving them from evil.—*World of the Sea.*

The International Bone of Contention.

One of the greatest works of the present century is the construction of the Suez Canal (completed in 1869). It connects the Mediterranean with the Red Sea, thus shortening the voyage to India by about 6,000 miles in distance, and a month in time. It is 86½ miles long, 250 feet wide, and deep enough to allow the largest vessels to pass through. Its cost was $130,000,000.

The Nicaragua Canal will no doubt be completed within the first quarter of the 20th century, and will do as much for the commerce of the western hemisphere as the Suez Canal has done for the eastern half of the earth.

Hoosac Tunnel.

The history of this gigantic enterprise is, since 1825, when it first began to be talked about, almost the history of Massachusetts. It stretches its dark length of 4½ miles under the Hoosac Mountain in Massachusetts, and is the jugular vein between New England and all the West. Many bold capitalists and experienced borers took a hard pull at it, sunk their fortunes and quit. Finally the State shouldered the job, and it went through. First estimated cost of tunnel and track, $4,350,000. Final cost to the State, $14,000,000. Total length, 24,416 feet; width, 24 feet; height, 20 feet. The first work was done in 1855, and the tunnel was substantially finished in 1874.

Chicago Tunnel.

This tunnel was begun in 1864, and finished in 1867. It is driven from the city out under Lake Michigan, and through it the city receives its water supply. Its length is two miles, and its cost was $457,844. The excavation was only five feet in diameter. A second tunnel seven feet in diameter, was completed in 1874, at a cost of $411,510. Both reach out to a well hole, into which the water filters. This enterprise has attracted a good deal of attention both in this country and Europe.

MARVELOUS FACTS ABOUT SMALL LIVING CREATURES

Norway Rats on a March.

Norway rats, to avert a famine, have a singular way of proceeding. When the time for the settlement of the question of partial extermination for the benefit of the race, or total extermination by starvation, can no longer be delayed, they assemble in countless thousands in some of the mountain valleys leading into the plains, and, the vast army of exiles being selected, they pour across the country in a straight line, a living stream, often exceeding a mile in length and many yards in breadth, devouring every green thing in their line of march, the country over which they have passed looking as if it had been plowed or burned with fire. They march principally by night and in the morning, resting during the day, but never seek to settle in any particular locality, however abundant food may be in it, for their final destination is the distant sea, and nothing animate or inanimate, if it can be surmounted, retards the straight onward tide of their advance. Foxes, lynxes, weasels, kites, owls, etc., hover on their line of march and destroy them by hundreds. The fish in the rivers and lakes lay a heavy toll upon them, and vast numbers are drowned and die by other accidents in "flood and field;" but the survivors, impelled by some irresistible instinct, press onward with no thought of stopping, until they lose themselves in the sea, sinking in its depths as they become exhausted, in such numbers that for miles their bodies, thrown up by the tide, lie putrefying on the shore.—*Temple Bar.*

How the Chicken Grows in the Egg.

The hen has scarcely set on her eggs twelve hours before some lineament of the head and body of the chicken appear. The heart may be seen to beat at the end of a second day; it has at that time somewhat of the form of a horseshoe, but no blood yet appears. At the end of two days two vessels of blood are to be distinguished, the pulsation of which is visible; one of these is the left ventricle, and the other the root of the great artery. At the fiftieth hour one auricle of the heart appears, resembling a noose folded down upon itself. The beating of the heart is first observed in the auricle, and afterward in the ventricle. At the end of seventy hours the wings are distinguishable; and on the head two bubbles are seen for the brain, one for the bill, and two for the fore and hind parts of the head. Toward the end of the fourth day, the two auricles already visible draw nearer to the heart than before. The liver appears toward the fifth day. At the end of seven hours more, the lungs and the stomach become visible; and four hours afterward, the intestines, and loins and the upper jaw. At the one hundred and forty-fourth hour, two ventricles are visible, and two drops of blood instead of the single one which was before. The seventh day the brain begins to have some consistency. At the one hundred and nineteenth hour the bill opens and the flesh appears in the breast. In four hours more the breast bone is seen. In six hours after this, the ribs appear, forming from the back, and the bill is very visible, as well as the gall-bladder. The bill becomes green at the end of two hundred and thirty-six hours; and if the chicken be taken out of its covering, it evidently moves itself. At the two hundred and eighty-eighth the ribs are perfect. At the three hundred and thirty-first, the spleen draws near the stomach, and the lungs to the chest. At the end of three hundred and fifty-five hours, the bill frequently opens and shuts; at the end of the eighteenth day, the first cry of the chicken is heard. It afterward gets more strength

and grows continually, till at length it is enabled to set itself free from its confinement.—*Sturm's Reflections.*

How the Spider Spins Her Web.

Look carefully under her abdomen, and near the tip you will see six little nipples. Under these nipples, inside her body, there are special glands in which a kind of gum is secreted, and this dries when it comes into the air, and forms a silken thread, from which the spider hangs, and out of which she forms her web. And now comes the almost incredible part of the story. These nipples, which are called "spinnerets," have not merely one opening, like a cow's teat, but each one, tiny as it is, is pierced with at least a hundred holes, and when the spider begins her web, more than *six hundred separate strands go to make up a single thread.* The thread thus spun is stronger than steel. A bar of iron one inch in diameter will sustain a weight of 28 tons; a bar of steel 58 tons; and according to the computation based upon the fact that a fiber only one four-thousandth part of an inch in diameter will sustain 54 grains, a bar of spiders' silk an inch in diameter would support a weight of 74 tons. In other words, spiders' silk has nearly three times the supporting strength of iron.

The Balloon Spider.

Dr. G. Lincecum gives the following interesting report of the curious little balloon-spider and its work:

"I once observed," says the writer, "one of these spiders at work in the upper corner of an open outside door-shutter. She was spinning gossamer, of which she was forming a balloon, and clinging to her thorax was a little cluster of minute young spiders. She finished up the body of the balloon, threw out the long bow-lines, which were flapping and fluttering in the now gently-increasing breeze. Several minutes before she got all ready for the ascension, she seemed to be filling the bottom, and widening her hammock-shaped balloon; and now, the breeze being suitable, she moved to the cable in the stern, severed it, and her craft bounded upward, and, soaring northward, was soon beyond the scope of observation."

—*Atlantic Monthly.*

A Spider's Appetite.

In order to test what a spider could do in the way of eating, we arose about daybreak one morning to supply his fine web with a fly. At first, however, the spider did not come from his retreat, so we peeped among the leaves, and there discovered that an earwig had been caught, and was now being feasted on. The spider left the earwig, rolled up the fly, and at once returned to his "first course." This was at half-past 5 A.M., in September. At 7 A.M. the earwig had been demolished, and the spider, after resting a little while, and probably enjoying a nap, came down for the fly, which he had finished at 9 A.M. A little after 9 we supplied him with a daddy-long-legs, which was eaten by noon. At 1 o'clock a blowfly was greedily seized, and, with an appetite apparently no worse for his previous indulgence, he commenced on the blowfly. During the day, and toward the evening, a great many small green flies, or what are properly termed midges, had been caught in the web; of these we counted one hundred and twenty, all dead, and fast prisoners in the spider's net. Soon after dark, provided with a lantern, we went to examine whether the spider was suffering at all from indigestion, or in any other way from his previous meals; instead, however, of being thus affected, he was employed in rolling up together the various little green midges, which he then took to his retreat and ate. This process he repeated, carrying up the lots in little detachments, until the whole web was eaten, for the web and its contents were bundled up together. A slight rest of about an hour was followed by the most industrious web-making process, and, before daybreak, another web was ready to be used in the same way. Taking the relative size of the spider and the creatures he ate, and applying this to a man, it would be somewhat as follows: At daybreak, a lamb; at 9 A.M., a young camelopard; at 1 o'clock, a sheep; and during the night one hundred and twenty larks. This, we believe, would be a very fair allowance for one man during twenty-four hours; and could we find one gifted with such an appetite, we can readily comprehend how he might spin five miles of web without killing himself, provided he possessed the necessary machinery.

Wonderful Facts About the Ant.

Everything pertaining to these little beings is full of interest. Their general habits of life approach more nearly to those of human beings than do those of any other creature. The little midgets have learned pretty much all that is worth learning from us bigger people—particularly all that is bad. In their little way they can do a good deal that man can do, and some things that he cannot do; for Huber, Gould, McCook and others, who have made a special study of their habits, tell us how they build houses and cities, which they inhabit, surrounded by the royalty and splendor of ant-life, while others (the agricultural ants) are enthusiastically devoted to farm life. If they do not dress in equipage, nevertheless, like the Chinese, the Japanese, and other nations, they always observe the fashion of their race, and in all things are scrupulously clean and neat. Such a thing as a dirty ant it would be hard to find. Even the lazy ones (for there are plenty of lazy ones, notwithstanding their well-founded reputation for industry) generally manage to make their slaves attend to their master's toilet. They can dispute and hold communication with their fellows, though just how they do it has puzzled all the naturalists to find out, and the ants themselves are wise enough not to tell. As nations, they go to war, sometimes like men, for trifling causes; but generally, like the United States and Mexico, over the questions of boundary lines; but their armies are quite as well disciplined, and fight on the same general principles as those of any civilized nation. They keep domestic animals, beetles, and other insects, living in their houses, very much as we keep cats and dogs in ours, and many of them have extensive herds of aphides, a nectar-giving species of insect, which the ants tenderly care for. Some invisible bond makes all labor for the good of the whole. One of the principal rules in ant cities is for every member to help every other, who needs help; so we see that in some respects we are far behind the ants in civilization.

Different species of ants never live together, and yet, in seeming contradiction of this, you will sometimes find the red and black ants living in the same tunnel. The truth is, the black ants are the slaves of the red, and have been captured in war. They do all the servile work about the premises; in fact, the red ants are most tyrannical taskmasters. They are sometimes too lazy to walk, and will make the blacks lug them about in great style.

Perhaps the most interesting of all species is the agricultural ant of this country, which is a model farmer in its way, clearing a tract of land, sometimes twelve feet across, with avenues running up to it from different directions. In the center is the castle, or dwelling, and all about it the open court, which is kept smooth as any pavement, and where not a speck of grass is ever allowed to grow; but all about it the clever little insect actually sows seeds, and annually raises a crop of ant-rice, which is its food.

Considered in any light, the habits of these little creatures, their powers of reasoning, their language, political economy, and general knowledge of "men and things," are wonderful in the extreme.

The Wonders of a Flea.

When a flea is made to appear as large as an elephant, we can see all the wonderful parts of its formation, and are astonished to find that it has a coat of armor much more complete than ever warrior wore, and composed of strong polished plates, fitted over each other, each plate covered like a tortoise shell, and where they meet, hundreds of strong quills project, like those on the back of a porcupine and hedgehog. There is the arched neck, the bright eye, the transparent cases, the piercers to puncture the skin, a sucker to draw away the blood, six long-jointed legs, four of which are folded on the breast, all ready at any moment to be thrown out with tremendous force for that jump which bothers one when he wants to catch him, and at the end of each leg hooked claws to enable him to cling to whatever he alights upon. A flea can jump a hundred times its own length, which is the same as if a man jumped six hundred feet; and he can draw a load two hundred times his own weight.

A Bird that Turns Somersaults.

There's a pretty little bird that lives in China, called the fork-tailed titmouse.

He is about as big as a robin, and he has a red beak, orange-colored throat, green back, yellow legs, black tail, and red and yellow wings. Nearly all the colors are in his dress, you see, and he is a gay fellow. But this bird has a trick known to no other birds that ever I heard of. He turns somersaults! Not only does he do this in his free life on the trees, but also after he is caught and put in a cage. He just throws his head far back and over he goes, touching the bars of the cage, and alighting upon his feet on the floor or on a perch. He will do it over and over a number of times without stopping, as though he thought it great fun.—*St. Nicholas.*

The Tailor Bird.

In far away India there is a bird which builds its nest by sewing leaves together. How it does it is a wonder, but not more wonderful than is all bird architecture. And yet we marvel at the intelligence which enables a plain little bird to do work so strongly resembling that of us more knowing ones. Using its bill for a needle, and with strong silken threads of spider's webs, it sews the edges of the leaves together, very much as a tailor might do, only more securely if anything, as knots, or rather little buttons, are made by twisting the ends of the thread upon itself, both on the inside and the outside of the leaves. The leaves having been thus securely fastened together, the inside is then softly and warmly padded, thus making a very compact and beautifully felted cup. The skill of these birds is perfect, and we marvel at it, until we think of the architecture of the bees, and of many other creatures whose work, although it does not so much resemble that of man, is none the less ingenious and wonderful.—*Scientific Miscellany.*

The Pigeons of Venice.

The pigeons of Venice are the proteges of the city, as the lions of St. Mark are its protectors. They are fed every day at 2 o'clock. A dinner-bell is rung for them; and they are not allowed to be interfered with. Any person found ill-treating a pigeon is arrested. If it is his first offence he is fined; if he be an old offender, he is sent to prison. In the good old days of the republic the guilt of shedding a pigeon's blood could only be expiated by the law of Moses taking full effect upon the culprit in the spirit of "an eye for an eye and a tooth for a tooth," much as the same law was brought to bear on poachers, sheep-stealers, and others in Great Britian eighty years ago.

It is believed by the credulous that the pigeons of Venice are in some way connected with the prosperity of the city; that they fly round it three times every day in honor of the Trinity; and that their being domiciled in the town is a sign that it will not be swallowed up by the waves. When it is high-water they perch on the top of the tower. When the Venetians were at war, or when there was any prospect of a change of dynasty, they would gather round the lion of St. Mark, over the entrance to the cathedral, and consult in a low voice about the destinies of the city. Doubt these facts if you like, but not in Venice. What spiders were to Robert Bruce, what crocodiles are to certain wild tribes in Africa, the columbines, or little pigeons, are to the Venetians.—*All the Year Round.*

Flights of Birds.

Some birds fly sixty feet in a second; but a race-horse rarely exceeds forty feet in the same time. The rice bird, which becomes known as the reed bird of Delaware Bay, and the bobolink of New York, is often found below Philadelphia, with green rice in its crop. The same thing is true of pigeons during the rice-growing season. Hawks and many other birds probably fly at the rate of one hundred and fifty miles an hour. Sir George Cayley computes the common crow to fly at nearly twenty-five miles an hour. Spallanzani found the rate of the swallow at about ninety-two miles an hour, while he conjectures the rapidity of the swift to be nearly three times greater. A falcon which belonged to Henry IV., of France, escaped from Fontainebleau, and in twenty-four hours afterward was found at Malta, a distance of not less than 1,500 miles, a velocity nearly equal to fifty-seven miles an hour, supposing the falcon to have been unceasingly on the wing. But, as such birds never fly by night, and allowing the day to be the longest, his flight was, perhaps, equal to seventy-five miles per hour.

CURIOUS FACTS ABOUT WOOD AND TREES

The Largest Trees in the World.

The real giants of the forest are found only along the western flank of the Sierra Nevada Mountains in California. To the northward they are found in groups only. The trees in most of these groups have been counted. Those of the Calaveras group number twelve hundred; in the Tuolumne and Merced groups there are less than one hundred; in the well-known Mariposa grove, about six hundred; and in the North King's River grove, less than half as many; but the Fresno group, the largest congregation of the north, occupies an area of three or four square miles. In addition to these we have the Dinky grove: but farther southward the trees stretch majestically across the broad rugged basin of the Keweah and Tule in noble forests, a distance of nearly seventy miles, the continuity of this magnificent belt being broken only by deep, sheer-walled canyons. These *sequoia gigantea* are the monarchs of monarchs—the master existence of these unrivaled forests. The average stature attained by the big tree under favorable conditions is perhaps about 275 feet, with a diameter of 20 feet. Few full-grown specimens fall much short of this, while many are 25 feet in diameter, and nearly 300 feet high. Fortunate trees, so situated as to have escaped the destructive action of fire, which has ever been the formidable enemy of the sequoias, are occasionally found measuring 30 feet in diameter, and very rarely one that is much larger. Yet so exquisitely harmonious are even the very mightiest of these monarchs, in all their proportions and circumstances, that never is anything overgrown or huge-looking about them, and the first exclamation, on coming upon a group for the first time, is usually, "See what *beautiful* trees!" Their real, godlike grandeur in the meantime is invisible; but to the loving eye it will be manifested sooner or later, stealing slowly on the senses like the grandeur of Niagara, or of some lofty Yosemite dome. The most notable tree in the well-known Mariposa grove is the Grisly Giant, some 30 feet in diameter, growing on the top of a stony ridge. A section of this tree, 25 feet in diameter was shown at the Centennial, Chicago and other Fairs. The age, counted by three different persons, is from 2,125 to 2,317 years, the fineness of the annual wood rings making accurate count difficult. Some of the trees are undoubtedly much older. A specimen observed by me in the New King's River Forest is probably over 4,000 years old. It measured nearly 40 feet in diameter inside the bark. Many of these mighty monarchs are known to the world at large by familiar names, such as "General Grant," "The Three Graces," "The Faithful Couple," etc. Through the erect trunk of one dead giant a passage has been cleft, through which the great stage coach thunders on its way. The California Indians have a saying that other trees grow, but the Great Spirit created the sequoias out of hand. It is the savage way of calling them miracles. And they are; for how a tree from twenty-five to thirty stories high, and with room, if hollowed, to shelter three hundred guests, and leave stabling quarters on the ground floor for a dozen horses, could have pumped from the earth and inspired from the air material enough to build itself along without waiting, is incomprehensible. —*Condensed from John Muir and B. F. Taylor.*

The Oldest Timber in the World.

Probably the oldest timber in the world which has been subjected to the use of man, is that which is found in the ancient temple of Egypt. It is found in connection with stone work, which is known to be at least

four thousand years old. This wood, and the only wood used in the construction of the temple, is in the form of ties, holding the end of one stone to another in its upper surface. When two blocks were laid in place, then it appears that an excavation about an inch deep was made into each block, into which an hour-glass shaped tie was driven. It is, therefore, very difficult to force any stone from its position. The ties appear to have been the tamarisk, or shittim wood, of which the ark was constructed, a sacred tree in ancient Egypt, and now very rarely found in the Valley of the Nile. Those dove-tailed ties are just as sound now as on the day of their insertion. Although fuel is extremely scarce in that country, these bits of wood are not large enough to make it an object with Arabs to heave off layer after layer of stone for so small a prize. Had they been of bronze, half the old temples would have been destroyed long ago, so precious would they have been for various purposes. The coffins of Egyptian mummies are also other very old specimens of wood.

A Tree that Lives 5,000 Years.

The queerest of trees must be the boabab, or monkey bread. It grows to the height of forty feet, "but its girth is entirely out of proportion to its height, some trees being thirty feet in diameter. An old boabab in Africa is, then, more like a forest than a single tree. Their age is incalculable." Humboldt considers them as "the oldest living organic monuments of our planet." Some trees are believed to be 5,000 years old. You can cut a good sized room into the trunk of a boabab, with comfortable accommodations for thirty men, and the tree lives on and flourishes. It produces fruit about a foot long, which is edible. As an example of slow growth in England, a boabab at Kew, though more than eighty years old, has only attained a height of four and a half feet. A kindred species of the African boabab grows in Australia. They have been measured, being thirty-five feet high, with a girth of eighty-five feet.

Plants that Eat Animals.

The most knowing ones among scientists confess that they cannot draw the line between the vegetable and the animal kingdom. Sponges, corals, and many other wonders of the sea, seem to bestride that line, one foot on either side, as we might say. So, also, do the insect-eating plants It is proven beyond question that paralysis of a plant can be produced by external injury, showing the existence of a nervous system.

There are some seven or eight well-defined varieties of plants that exist largely on captured prey. Such are various kinds of pitcher plants, which stand up in queenly fashion—genuine pitchers, with a little lid at the top. Now, here comes a wondering bee, browsing along with as much noise as a brass band. Will he be wise enough to avoid his danger? We shall see. He alights on the very brim of the pitcher. It is covered with the richest honey. Farther and farther he descends. He might as well bid the world good-night, for down comes the lid with a *bang* (we might almost say). He is a "goner". Smothered and blinded, sooner or later he falls to the bottom, where he is drowned in a puddle of water—not water, but the gastric juice of the animal's (!) stomach, which digests him precisely as a man's stomach digests beefsteak. He will be watched for in vain at the home hive. Some pitcher plants are wonders of plant architecture. Their tops grow over, forming a regular hood, with the entrance beneath; but the bees always find it to their sorrow.

Then there is the Venus fly-trap. It is little, but the same shape as if you should put your two open palms side by side. On the surface is honey, and sharp needles sticking up. A fly is attracted by the honey and alights. Instantly the two palms close as one. The fly is between and the needles pierce him through and through. He is another goner. Then the plant stays closed until everything good in the fly is eaten up—many days perhaps. Our little fly-trap knows its business very well, and is not to be fooled Put a little piece of beefsteak on the open disks; they close at once. Now try a piece of wood or earth. This is not food, and the Venus knows it. There is no motion. Strange, isn't it?

A Petrified Forest.

From Mr. David Rideout, who was engaged in preparing a section of a petrified tree for the Centennial Exhibition, the Winnemucca (Nevada) *Star* learns the following relating to the petrified forest in the desert of Northwestern Humboldt:

"On the plain, about thirty miles from the Blackrock range of mountains, stands one of the greatest natural curiosities ever discovered in Nevada. It is a petrified forest, in which the stumps of many of the trees, now changed into solid rock, are still standing. There are no living trees or vegetation of any kind, other than stunted sage brush, in the vicinity. Some of these ancient giants of the forest, which flourished, perhaps, thousands of years ago, when the climate of Nevada was undoubtedly more favorable for the growth of luxurious vegetation than at present, rival in size the big trees of California. Stumps, transformed into solid rock, stand in an upright position, with their roots embedded in the soil, as when growing, that measure from fifteen to twenty feet in circumference, and the ground in the vicinity is strewn with the trunks and limbs, which retain their natural shape and size. Mr. Rideout, determining to secure a section of one of these trees for the Centennial Exhibition, with two other men, spent twelve days in cutting it from the stump. This was accomplished by drilling all around the tree and separating it with wedges. The specimen is three feet high and eighteen feet in circumference, and its estimated weight is three tons."

The Dwarf Trees of Japan.

Gardeners in Japan display astonishing art. The plum, which is a great favorite, is so trained and cultivated that the blossoms are as big as those of dahlias. They have gradually succeeded in dwarfing the fig, plum and cherry trees, and the vine to a stature so diminutive as scarcely to be credited by a foreigner, and yet those dwarf trees are covered with blossoms and leaves. Maylon, whose work on Japan was published at Amsterdam in 1830, states that the Dutch agent of commerce in Naganei was offered a snuff-box, one inch in thickness and three long, in which grew a fig tree, a bamboo and a plum tree in bloom. But it is especially members of the coniferous family that are thus dwarfed. Much patience is needed, and there are trees 200 years old, or more, which scarcely reach a foot in height. Such a tree can be bought for $8.00 or $10.00, and it is marvelous how a tree that needed care during a time of two centuries can be sold for such a trifle. Where does the compensation for care and work come in?

Why Called Rosewood.

It has puzzled many people to decide why the dark wood so highly valued for furniture should be called "rosewood." Its color certainly does not look much like a rose, so we must look for some other reason. Upon asking, we are told that when the tree is first cut the fresh wood possesses a very strong, rose-like fragrance—hence the name. There are half a dozen or more kinds of rosewood trees. The varieties are found in South America and in the East Indies and neighboring islands. Sometimes the trees grow so large that planks four feet broad and ten feet in length can be cut from them. These broad planks are principally used to make the tops of pianofortes. When growing in the forest, the rosewood tree is remarkable for its beauty, but such is its value in manufacture as an ornamental wood that some of the forests where it once grew abundantly now have scarcely a single specimen. In Madras cultivation of the tree on plantations is carried on extensively.

The Facts and Fables of the Upas Tree.

The upas is a tree belonging to the bread-fruit family, which grows on the Island of Java. It grows to about 100 feet in height, with a straight trunk and rounded head. The leaves are oblong, about five inches in length. The tree has small white flowers and a small purple fruit, like a plum. When this tree was first made known, extraordinary stories were told of it by a surgeon in the service of the Dutch East India Company, who published a narrative concerning his experience on the island, in 1783. He said that the emanations of the tree killed all living things near it, even the birds that flew over it falling dead; that criminals condemned to death were sent to the tree to

THE BEAUTIFUL SPANISH SINGER AND HER MANDOLIN

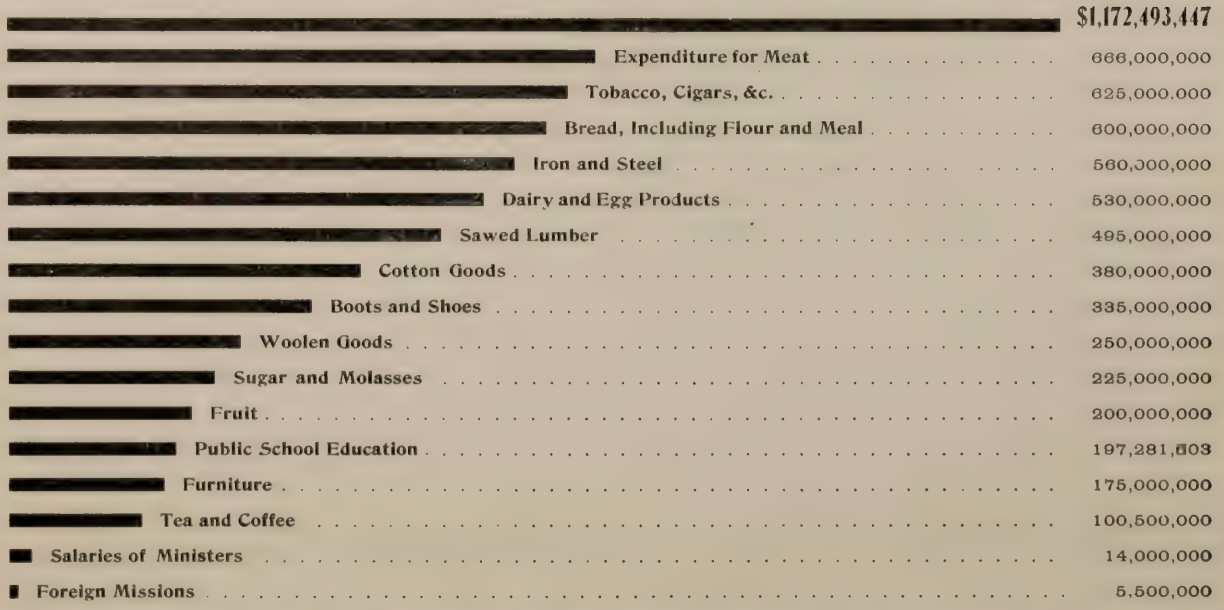
gather its poisons, and but two out of twenty ever returned. He declared that those fortunate enough to come back alive assured him that the tree grew in a valley, with no other living thing, not even a plant or blade of grass within miles of it, and that of 1,600 persons who had been forced by a civil war to encamp about fourteen miles from the tree, all but 300 died. These stories were accepted and repeated, until they were altogether disproved in 1810. Evidently Dr. Foersch must have strangely confounded the upas tree with the poison valley, a locality rendered deadly by emanations of carbonic acid from rocks in the vicinity. The upas actually grows in the forest with other trees, and no animals show any especial fear of it. Its emanations are somewhat poisonous to the skin of human beings, but not more so than those of the sumach or other similar plants, and like these are poisonous to some persons and not to others. The juice or sap of the tree is poisonous to the blood, and has been used by the Javans from time immemorial to poison the points of their arrows and spears. The substance, when introduced into the circulation, acts directly on the principal blood-vessels, causing death in a short time by congestion.

The Lace Bark Tree.

The lace bark tree is a native of Jamaica, and is known to the botanist as Lagetta lintearia. The texture of its inner bark consists of numerous concentric layers of fibre interlacing in all directions. From this fibre, which may be divided and subdivided until it is of the texture of a cobweb, the natives make all sorts of curious and ornamental articles, such as trimming for hats, doylies, centre pieces, toilet sets, etc.

The fibre is very tough and bears hard usage remarkably well. The branches of the tree are hollow. The outer bark is a mottled brown color and comparatively smooth and is easily stripped off, bringing the creamy white fibre to view.

TABLE SHOWING THE AMOUNT OF MONEY SPENT IN THE UNITED STATES IN 1900 FOR INTOXICATING LIQUORS AS COMPARED WITH OTHER EXPENDITURES



According to the reports of the *State Boards of Statistics*, eighty-one per cent. of the criminals of our country, eighty per cent. of the paupers, fifty-five per cent. of the cases of insanity, and forty-four per cent. of the idiotic and feeble-minded, are traceable to the use of intoxicating liquors. The last census reports, **700,000** drunkards in the United States. About 100,000 of them perish annually from the effects of intoxicants, multitudes of the innocent lose their lives by accident, and women and children are beggared, heart-broken and ruined without number.

BOOK IX

BIOGRAPHY AND ANECDOTE

IN TWO PARTS

PART I.

A Dictionary of the Distinguished People of the World

Embracing the Dates of Birth and Death, Nationalities, Vocations and Greatest Achievements of nearly 1000 Famous Men and Women of all Lands and Times.

PART II.

Anecdotes and Incidents

Throwing Light on the Lives and Characters of Great and Historic Personages.

THE PORTRAITS preceding the Text of this Department are of Distinguished Persons, all of whom were living at the beginning of the year 1902, and embrace the Kings, Queens and Rulers of all the Principal Countries of the Earth.

BIOGRAPHY AND ANECDOTE

PART I. A DICTIONARY OF DISTINGUISHED PEOPLE OF THE WORLD

Abbott, J. S. C. American historian. *Life of Napoleon Bonaparte, History of Russia.* Born, 1805; died, 1877.

Abbott, Emma. A noted American singer and prima donna. Mrs. E. J. Wetherell. Born, 1849; died, 1891.

Abbott, Lyman. American clergyman and author; succeeded Beecher as pastor of Plymouth Church; editor *Outlook.* Born, 1835.

Adams, John. American President and diplomatist, graduated at Harvard; school-teacher and lawyer; defended British soldiers implicated in Boston Massacre, 1770; delegate to Continental Congress, 1774; commissioner to France, 1778; minister to Holland, 1781; one of the negotiators of treaty of peace with Great Britain, 1782; minister to Great Britain, 1785–88; Vice-President, 1789–97; President, 1797–1801. Born, 1735; died, 1826.

Adams, John Quincy (son of John). American President and diplomatist, graduated at Harvard; minister to Holland, 1794; to Prussia, 1797; elected to U. S. Senate by Federalists, 1803; resigned, 1808; minister to Russia, 1809; one of the negotiators of the treaty of peace with Great Britain, 1814; minister to England, 1816–17; Secretary of State, 1817–1825; President, 1825–29; M. C., 1830 till his death. Born, 1767; died, 1848.

Adams, Samuel. American Revolutionary patriot and statesman; Governor of Massachusetts; one of the foremost popular leaders of the Revolution. Born, 1722; died, 1803.

Addison, Joseph. English man of letters, poet, humorist, moralist, dramatist; Under-Secretary of State, 1705; M. P., 1708. His poem *The Campaign,* on the battle of Blenheim, had a great success. Much of the *Tatler* (edited by Steele) and three-fourths of the *Spectator* are his. Born, 1672; died, 1719.

Æschines. Athenian orator; rival of Demosthenes, and supporter of Philip of Macedonia. *Orations.* Born, B. C. 389; died, 314.

Æschylus. Sublime Athenian tragic writer. *Agamemnon the Persian.* Born, B. C. 525; died, 456.

Æsop. Greek fabulist of the 6th century B. C. *Fables.*

Agassiz, Louis. Swiss naturalist and man of science, Professor at Harvard; founder of the Museum of Comparative Zoology at Cambridge, Mass. *Researches on Fossil Fishes.* Born, 1807; died, 1873.

Agricola, Cnæus Julius. Roman general; built line of fortresses across Scotland; father-in-law of the historian Tacitus. Born, 37; died, 93.

Agrippina. Mother of the Emperor Nero, infamously cruel and sensual; put to death by Nero. Born, 15; died, 60.

Aguinaldo, Emile. A Philippine soldier and statesman; leader of the revolt against Spain and the war against the United States; captured and took oath of allegiance to the United States in 1901. Born, 1869.

Alaric I. King of the Visigoths, captured Rome. Born, 350; died, 410.

Albert, Prince Consort of England; husband of Queen Victoria; man of noble character. Born, 1819; died, 1861.

Alcibiades. Athenian statesman and commander. Led Athenian fleet; conquered at Cyzicus and Cynossema; annexed Chalcedon and Byzantium. Handsome, talented, fickle, vain. Born, 450; died, 404.

Alcott, Louisa M. American author. *Little Women; An Old Fashioned Girl; Hospital Sketches.* Born, 1833; died, 1888.

Aldrich, Thomas Bailey. American novelist and poet. *Prudence Palfrey; The Story of a Bad Boy.* Born, 1836.

Alexander the Great, King of Macedonia, conqueror. Aristotle was his tutor. He came to the throne in 336, razed Thebes, and was chosen by the Greeks commander of the forces against Persia; invaded Asia Minor (334), beat Darius at the Granicus, and cut the Gordian knot; defeated Darius at Issus (333); captured Tyre (332), invaded Egypt and founded Alexandria; routed Darius at Arbela (331); took Babylon, Persepolis, Susa, and invaded India till his army refused to proceed farther; died at Babylon. Born, B. C. 356; died, 323.

Alexander VI. (Borgia.) Pope 1492–1503. Infamous for his crimes. Born, 1430; died, 1503.

Alexander I. Czar of Russia (1801–25); one of the chief opponents of Napoleon, reorganized Russian army. Born, 1777; died, 1825.

Alexander II. Czar of Russia (1855–81); liberator of the serfs. Assassinated. Born, 1818; died, 1881.

Alexander III. Czar of Russia (1881-94.) Born, 1845; died, 1894.

Alfieri. An Italian dramatist. Spent his youth in dissipation; reformed and devoted himself to dramatic art. "Cleopatra" was his first successful drama. Tragedy was his *forte*. Buried at Florence. Born, 1749; died, 1803.

Alfred the Great. King of Wessex. Came to throne 871; lived in concealment to escape Danes; routed Danes, 878; allowed them to settle in his kingdom; repelled invasion of the Northmen, 896; founded a navy; established schools and a police system; encouraged literature. Born, 849; died, 901.

Allen, Ethan. American Revolutionary soldier; captured Ticonderoga "in the name of the great Jehovah and the Continental Congress." Born, 1737; died, 1789.

Alva, Duke of. Noted Spanish general during reign of Charles V. and Philip; Governor of the Low Countries; noted for his merciless cruelty. Born, 1508; died, 1582.

Ames, Fisher. American orator and statesman; Federalist member of Congress. *Speeches*. Born, 1758; died, 1808.

Amurath I. Sultan of Turkey; first of the Sultans to make European conquests. Born, 1319; died, 1389.

Andersen, Hans Christian. Danish author. *Fairy Tales for Children; The Improvisatore; The Poets' Bazaar*. Born, 1805; died, 1875.

André, Major John. English soldier in the American Revolution, hanged as a spy. Born, 1731; died, 1780.

Anne. Daughter of James II. Queen of England. Literature flourished in her reign. Born, 1664; died, 1714.

Antiochus. King of Syria. "The Great;" invaded Greece; defeated by the Romans. Born, B. C. 237; died, 187.

Antoinette, Marie. Queen of Louis XVI. of France. Guillotined. Born, 1755; died, 1793.

Antonius, Marcus (Mark Antony). Roman orator and statesman; triumvir with Octavianus and Lepidus. Lover of Cleopatra; defeated at Actium. Born, B. C. 83; died, 36.

Appius Claudius. Roman patrician. Decemvir; attempted to dishonor Virginia, daughter of Virginius. Died, B. C. 449.

Aquinas, Thomas. Scholastic Italian theologian. Author of *Summa Theologia*, to this day a standard authority in the Roman Catholic Church. His writings fill 17 folio volumes. While a member of the Council of Lyons, fell sick and died at that city. Born, 1226; died, 1274.

Archimedes. Syracusan mathematician and engineer; made many discoveries in hydrostatics and mechanics. *On the Sphere and Cylinder*. Born, B. C. 287; died, 212.

Aristides. "The Just." Athenian statesman. Rival of Themistocles. Died, B.C. 468.

Aristophanes. Greatest Greek comedy writer. *The Knights. The Clouds. The Birds*. Born, B. C. 444; died, 380.

Aristotle. Greek philosopher. Father of scientific natural history, and of logic. Tutor of Alexander the Great; taught at Athens in the Lyceum; left works on physics, metaphysics, ethics, dialectics, logic, mathematics, politics, economics. Born, B. C. 384; died, 322.

Arius. A noted Catholic theologian, a presbyter of Alexandria in the 4th century. Founder of Arian sect. Born, 280; poisoned, 336.

Arkwright, Sir Richard. Noted English inventor. Began life as a barber. Invented the spinning frame. Was mobbed because his machine threatened to interfere with labor. "This man," says Carlyle, "gave to England the power of cotton." Became very wealthy. Born, 1732; died, 1792.

Arminius, James. Dutch theologian; founder of Arminianism; denied Calvinistic doctrines of grace and predestination. Born, 1560; died, 1609.

Arnold, Benedict. American traitor. Tried to surrender West Point to the British. Born, 1740; died, 1801.

Arnold, Edwin. English journalist and poet, editor of the London *Telegraph*. *The Light of Asia; Light of the World*. Born, 1832.

Arnold, Matthew. English poet and critic. *God and the Bible; Poems; Essays in Criticism*. Born, 1822; died, 1888.

Arnold, Thomas. English educator and historian. Master of Rugby School. *History of Rome*. Born, 1795; died, 1842.

Arthur, Chester A. American President; born in Vermont and educated at Union College; admitted to the bar; Quartermaster-General of New York during the Civil War; Collector of the Port of New York, 1871–78; Vice-President, 1881; succeeded to Presidency on death of President Garfield, September, 1881. Born, 1830; died, 1886.

Ascham, Roger. Tutor of Queen Elizabeth. *The Schoolmaster; Toxophilus or the School of Shooting*. Born, 1515; died, 1568.

Astor, John Jacob. American millionaire; founder of the present Astor family. Born, 1763; died, 1848.

Attila. "The Scourge of God." King of the Huns. Invaded the Roman Empire. Died, 453

Audubon, John James. American naturalist. *Birds of America*. Born, 1782; died, 1831.

Augustine, Saint. Bishop of Hippo in Africa. Theologian, *De Civitate Dei*. Professor of rhetoric and philosophy at Milan, 384; was for a time immoral, but was converted about 386. Ordained priest 391. He wrote against the Pelagians, the treatises *On the Grace of Christ*, and *On Original Sin*. Born, 354; died, 430.

Augustus (Octavianus). First Roman Emperor. Conqueror at Actium, Patron of literature. Born, B. C. 65; died, A. D. 14

Aurelian. Roman Emperor. Conquered Zenobia and annexed her kingdom of Palmyra. Born, 212; died, 275.

Austen, Jane. English novelist. *Sense and Sensibility; Pride and Prejudice; Emma.* Born, 1775; died, 1817.

Bach, John Sebastian. German composer. *The Nativity.* Produced both secular and sacred music in great variety. Born, 1685; died, 1750.

Bacon, Francis, Viscount St. Albans, Lord Verulam. English statesman and philosopher. *Novum Organum; Advancement of Learning.* Counsel to Queen Elizabeth at 28; found guilty of corruption, 1621. Among his works are *Essays;* and *On the Wisdom of the Ancients.* His *Novum Organum* applies inductive method to study of science. Born, 1561; died, 1626.

Baker, Sir Samuel White. Noted English traveler in Africa and India. Wrote five books of travels. Born, 1821; died, 1893.

Balboa, Vasco Nuñez de. Spanish adventurer. Discoverer of the Pacific. Born, 1475; died, 1517.

Baltimore, Lord George Calvert. English statesman. Founder of Maryland. City of Baltimore named for him. Born, 1580; died, 1632.

Balzac, Honoré de. French novelist. *Comedie Humaine.* Born, 1799; died, 1850.

Bancroft, George. American diplomatist and historian. Minister to England, and to Germany; Secretary of the Navy. *History of United States.* Born, 1800; died, 1891.

Barneveldt, Jan van Olden. Dutch statesman, patriot, liberal leader. Beheaded. Born, 1549; died, 1619.

Barnum, Phineas T. American showman. Born, 1810; died, 1891.

Baxter, Richard. English Dissenting minister, writer. *The Saints' Rest.* Born, 1615; died, 1691.

Beauharnais, Alexander, Vicomte de. First husband of the Empress Josephine. Born, 1760; died, 1794.

Becket, Thomas à. Archbishop of Canterbury. Murdered; had controversy in defence of rights of the Church with Henry II. of England, whom he excommunicated. Born, 1117; died, 1170.

Bede, "The Venerable." Anglo-Saxon historian. *Ecclesiastical History of the English Nation.* Born, 672; died, 735.

Beecher, Lyman. American Congregational preacher, and theologian. *Views on Theology.* Born, 1775; died, 1836.

Beecher, Henry Ward. American preacher, lecturer, and orator, at Brooklyn, N. Y. *Star Papers.* Born, 1813; died, 1887.

Beethoven, Louis von. German composer. *Ninth Symphony.* For a time organist to the Elector of Cologne; settled in Vienna, where he produced (1802) his *Sinfonia Eroica.* In 1805 appeared his opera of *Lenore.* He composed many symphonies, cantatas, and overtures. Born, 1770; died, 1827.

Bell, A. G. American inventor. Inventor of the Bell telephone. Born, 1847.

Bennett, James Gordon. American journalist. Proprietor of the *N. Y. Herald.* Born, 1795; died, 1872.

Berlichingen, Goetz von ("The Iron-Handed"). German hero. Immortalized by Goethe. Slain in war of peasants against nobles. Born, 1480; died, 1562.

Bernard, Saint. Abbot of Clairvaux. French ecclesiastic. Born at Dijon, in Burgundy. He was active in bringing about the crusade of 1146; canonized in 1174. Born, 1091; died, 1153.

Bernhardt, Sarah. The most noted French actress of modern times, if, indeed, she may not be called the most famous actress of all time. She traveled over the countries of Europe and America a number of times, always rendering her plays in the French language, yet commanding higher prices than any other person on the stage, the popular prices for choice seats in 1900–1901 in New York and Philadelphia being $10 to $25. Born, 1844.

Besant, Sir Walter. English novelist. Eminent chiefly for the healthy realistic type of his work. Champion of the cause of Authors versus Publishers. Born, 1838; died, 1901.

Bismarck, Otto von. German statesman; 1847, member United Diet and leader of Conservatives; ambassador to Russia, 1809; Prime Minister of Prussia, 1862; Chancellor of the German Empire. Born, 1813; died, 1898.

Black, William. Scotch novelist; originally a journalist. *A Daughter of Heth; Strange Adventures of a Phaeton; A Princess of Thule; Madcap Violet.* Born, 1841; died, 1899.

Black Hawk. Indian chief. Hero of the Black Hawk War. Born, 1768; died, 1838.

Blackstone, Sir William. English judge, and law writer. *Commentaries.* Born, 1723; died, 1780.

Blaine, James Gillespie. American Republican politician; U. S. Senator from Maine; Speaker, House Representatives; Secretary of State. Born, 1830; died, 1893.

Blake, Robert. Great English admiral and sea king. Annihilated Spanish fleet in Santa Cruz Bay. Born, 1598; died, 1657.

Blücher, Gebhard L. von. Prussian field marshal; decided the battle of Waterloo by coming with his force in the evening. Born, 1742; died, 1819.

Boleyn, Anne. 2d Queen of Henry VIII. Beheaded. Born, 1507; died, 1536.

Bolivar, Simon. Liberator of the Spanish South American colonies. Born, 1783; died, 1830.

Bonaparte, Caroline M. A. Sister of Napoleon I. Wife of Murat. Born, 1782; died, 1839.

Bonaparte, Jerome, born, 1784; died, 1860. Joseph, born, 1766; died, 1844. Louis Napoleon, born, 1778; died, 1846. Brothers of Napoleon. Kings respectively of Westphalia, Spain, Holland.

Bonaparte, Maria Letitia. Mother of Napoleon I. Born, 1750; died, 1836.

Bonaparte, Napoleon. Napoleon I. Emperor of France. Captain of Artillery, 1792; crushed insurrection in Paris, 1795; married Josephine Beauharnais, and took command of the army of Italy, 1796; conquered Austria and the Pope, 1797; made an expedition to Egypt, 1798; made First Consul, 1799; conquered at Marengo, 1800; made peace with England, 1802, and about this time produced his *Civil Code.* Became Emperor, 1804; engaged in war with England, Russia, Sweden, Prussia; married Marie Louise,

1810; made a disastrous campaign in Russia, 1812; was beaten at Leipzig, 1813; retired to Elba, 1814; returned to France, and was conquered at Waterloo, and sent to St. Helena, 1815. Born, 1769; died, 1821.

Bonheur, Rosa. Celebrated French painter of animals. Born at Bordeaux. Brought up in poverty. Taught by her father. Best known works "The Horse Fair" and "Hay Harvest in Auvergne." "Ploughing with Oxen" is her masterpiece. Born, 1822; died, 1900.

Boniface VIII. Pope; 1294–1303. Excommunicated Philip the Fair of France. Born, 1228; died, 1303.

Boone, Daniel. American explorer and hunter. Father of the present State of Kentucky. Born, 1735; died, 1820.

Booth, Edwin. American actor. Among his best parts are *Richelieu*, *Iago*, *Hamlet*, and *Berbuccio* in the *Fool's Revenge*. Born, 1833; died, 1893.

Booth, Junius Brutus. English tragedian. Great in Shakespearean parts, especially *Richard III.*; came to America. Father of Edwin and John Wilkes. Born, 1796; died, 1852.

Booth, William. Great English evangelist. Founder and general of the Salvation Army. Born, 1839.

Borgia, Cæsar. Italian soldier and statesman. Just as a ruler in his own domain, but crafty and cruel personally. A patron of art and literature. Son of Pope Alexander VI. Born, 1476; died, 1507.

Boswell, James. Scotch biographer of Dr. Johnson. *Boswell's Life of Johnson*. Born, 1740; died, 1795.

Bowdoin, James. American statesman. Governor of Massachusetts. Founder of Bowdoin College. Born, 1727; died, 1790.

Braddock, Edward. British general in America. Defeated by Indians. Born, 1715; died, 1755.

Breckenridge, John C. American politician. Vice-President (1857–1861). Confederate general. A Democratic candidate for President, 1860. Born, 1821; died, 1875.

Bright, John. English Radical, statesman, and orator. Opponent of Corn Laws; member of Gladstone's cabinet. Born, 1811; died, 1889.

Bronte, Charlotte. "Currer Bell." English novelist; 1848, *Jane Eyre;* 1849, *Shirley;* 1852, *Villette;* 1854, married Rev. Arthur B. Nichols. Born, 1816; died, 1855.

Brown, John. American abolitionist leader. Captured by Robert Lee, at Harper's Ferry, tried and hanged as a conspirator. Born, 1800; died, 1859.

Browne, Charles F. "Artemus Ward." American humorous writer. Born, 1835; died, 1867.

Browning, Mrs. Elizabeth Barrett. English poetess; wrote verses at ten; *The Drama of Exile;* 1844, *Poems;* 1856, *Aurora Leigh;* married Robert Browning in 1846. Born, 1809; died, 1861.

Browning, Robert. English poet. Among his works are *Pippa Passes; The Blood on the 'Scutcheon; The Red-Cotton Night-Cap Country*, and *Idyls*. Born, 1812; died, 1889.

Brownlow, William G. American journalist and politician; Governor of Tennessee; U. S. Senator. Born, 1805; died, 1877.

Bruce, Robert. King of Scotland. Defeated Edward II. at Bannockburn, 1314. Born, 1274; died, 1329.

Brummell, George B. "Beau Brummell." English man of fashion. Born, 1778; died, 1840.

Brutus, Lucius Junius. Roman patriot; overthrew Tarquin and established Republican government at Rome. Flourished 6th century, B. C.

Brutus, Marcus Junius. One of Cæsar's assassins. Defeated at Philippi. Committed suicide. Born, B. C. 85; died, 42.

Bryan, William Jennings. American statesman, born in Salem, Illinois; entered Congress in 1890 as an extreme Free Silver man; was twice nominated for the Presidency in opposition to Mr. McKinley, but defeated in 1896 and again in 1900. Born, 1860.

Bryant, William Cullen. American poet. *Thanatopsis*. Born in Massachusetts; at 13 wrote *The Embargo* and *The Spanish Revolution;* published *The Ages*, 1821; became an editor of the New York *Evening Post* in 1826; *Translation of Homer*, 1867. Born, 1794; died, 1878.

Buchanan, James. American president; born in Pennsylvania; admitted to bar, 1812; M. C., 1821–31; minister to Russia, 1832–4; U. S. Senator, 1834–45; Secretary of State, 1845–9; minister to England, 1852–6; signed Ostend Manifesto, 1854; President, 1857–61. Born, 1791; died, 1868.

Bunyan, John. English author. *Pilgrim's Progress; The Holy City; The Holy War*. For several years led a dissipated, wandering life; joined Anabaptists in 1654; became Baptist minister, 1655; in prison, 1660–72; there wrote part of *Pilgrim's Progress* (1678); after his release, was minister at Bedford. Born, 1628; died, 1688.

Burr, Aaron. American lawyer and statesman; Vice-President. Tried for (and acquitted) of treason. Killed Alexander Hamilton in a duel. Born, 1756; died, 1836.

Butler, Benjamin F. American lawyer, politician and general; member of Congress; military governor of New Orleans. Born, 1818; died, 1892.

Byron, George Gordon, Lord. English poet. *Childe Harold, Don Juan; Cain; Manfred; Marino Faliero; The Two Foscari; Beppo; The Vision of Judgment; The Prisoner of Chillon; The Siege of Corinth; Mazeppa; English Bards, and Scotch Reviewers; Parisina; The Deformed Transformed*. Born, 1788; died, 1824.

Cæsar, Caius Julius. Roman general and statesman. Dictator. Quæstor, 58 B.C.; ædile, 65; pontifex maximus, 64; consul, 59 (alliance with Pompey and Crassus called first triumvirate); was granted both the Gauls for 5 years; conquered many tribes, and invaded England; crossed Rubicon and entered Rome; conquered Pompey at Pharsalia (48); subdued Spain and Africa; made imperator; assassinated by Brutus, Cassius, and others. Born, B. C. 99; died, 44.

THE GREAT MONARCHS OF EUROPE

Cable, George W. American novelist. *Old Créole Days, The Grandissimes, John March, Southerner.* Born, 1844.

Caine, Thomas Henry Hall. English novelist. *The Deemster, The Manxman, The Christian.* Born, 1853.

Calhoun, John Caldwell. American statesman. Vice-President. Native, South Carolina; elected to Congress, 1810; Secretary of War, 1817; Vice-President, 1829-32; resigned in latter year and entered Senate; Secretary of State, 1844; re-entered Senate, 1845; "State's Rights" leader; left, among other writings, a *Treatise on the Nature of Government.* Born, 1783; died, 1850.

Caligula. Emperor of Rome (37–41). Insanely cruel, sensual, impious. Built temple to himself. Born, 12; died, 41.

Calvert, Cecilius. Second Lord Baltimore; was first proprietor of Maryland. Especially distinguished as one of the pioneers of civil and religious liberty. Born, —; died, 1676.

Calvin, John. French theologian. The fundamental doctrines of his theology were unconditional reprobation and election. He published *Commentaries on the Harmony of the Gospel.* Born, 1509; died, 1564.

Campbell, Alexander D. P. Born in Ireland. Founder of the religious sect known as Campbellites, but calling themselves "The Christian Church." Founded Bethany College, Va. Born, 1788; died, 1866.

Camoens, Luis or Luiz. The greatest of Portuguese poets. *The Lusiad* and other poems of rare merit. So neglected and died in such poverty that he has been called *the glory and shame of Portugal.* Born, 1517; died, 1579.

Campbell, Thomas. Scotch poet. Son of a Glasgow merchant. *Pleasures of Hope, Exile of Erin, Ye Mariners of England, Lochiel's Warning.* Born, 1777; died, 1844.

Canning, George. English statesman and orator. Prime Minister; 1807, Secretary for foreign affairs; fought duel with Castlereagh; premier, 1827. Born, 1770; died, 1827.

Canova, Antonio. Italian sculptor. Among his works are *Venus and Adonis, The Graces,* and a *statue of Washington.* Born, 1757; died, 1822.

Canute II. King of Denmark and conqueror of England in 1016. Governed his three kingdoms of Denmark, Norway and England with great firmness and prudence. Born, about 985; died, 1036.

Caprivi, George Leo Graf von. German statesman. In Prussian army 1849–1890. Succeeded Bismarck as chancellor and prime minister in 1890. Born, 1831; died, 1899.

Carleton, Will. American poet. *Farm Ballads.* Born 1845.

Carlyle, Thomas. Scotch historian and essayist. Published *Sartor Resartus,* 1834; *French Revolution,* 1837; *Chartism,* 1839; *Heroes and Hero Worship,* 1840; *Past and Present,* 1843; *Latter Day Pamphlets; Oliver Cromwell's Letters and Speeches,* 1845; *Life of John Sterling,* 1851; *Life of Frederick the Great,* 1858–64. Born, 1795; died, 1881.

Carnegie, Andrew. American manufacturer and capitalist, of Scotch birth. Grew immensely wealthy in the iron and steel business. Withdrew in 1901 with fortune of $250,000,000. Gave many million dollars to found libraries and schools. *Triumphant Democracy.* Born, 1835.

Carnot, Marie Francois Sadi. President of France. Grandson of Lazare Carnot, prominent in the Revolution and Empire. In National Assembly, 1871; finance minister, 1881 and 1887; elected President in 1887; assassinated by an anarchist. Born, 1837; died, 1894.

Castelar, Emilio. Spanish statesman and author. Active in the Cortes; dictator in 1873; withdrew from political life 1893. Wrote historical and political works. Born, 1832.

Carroll, Charles (of Carrollton). American Revolutionary statesman. Signer of the Declaration of Independence. Very wealthy. Born, 1737; died, 1832.

Cartwright, Edmund. English inventor. Parliament voted him 10,000 pounds for inventing the power loom. Born, 1743; died, 1823.

Cass, Lewis. American statesman and diplomatist. U. S. Senator from Michigan. Democratic candidate for President, 1840; Secretary of State. Born, 1782; died, 1866.

Catherine of Aragon. Queen of Henry VIII. of England. Divorced. Born, 1486; died, 1536.

Catherine de Medici. Queen of Henry II. of France. Strenuous opponent of Protestantism and the Huguenots. Instigated the "Massacre of St. Bartholemew." Born, 1519; died, 1589.

Catherine I. Wife of Peter the Great. Empress of Russia; succeeded to government on his death. Born, 1682; died, 1727.

Catherine II. Empress of Russia; often called "The Great." Born, 1729; died, 1796.

Cato, Marcus Portius. Opponent of Cæsar; famed for probity. Committed suicide. Born, B. C. 95; died, 46.

Cavour, Camillo B. Count. Famous Italian statesman. First Prime Minister to the Kingdom of Italy. Born, 1810; died, 1861.

Caxton, William. English scholar and merchant. Distinguished for introducing printing into England. Born, 1412; died, 1492.

Cecil, William, Lord Burleigh. Lord Treasurer of England, under Elizabeth. Born, 1520; died, 1598.

Cervantes Saavedra, Miguel. Spanish novelist and satirist. *Don Quixote.* Born, 1547; died, 1616.

Chalmers, Thomas. Scotch preacher and theologian. Founder of the "Free Church" in Scotland. *Astronomy in its Connection with Religion.* Born, 1780; died 1847.

Chamberlain, Joseph. English Radical statesman; President of the Board of Trade; Colonial Secretary during the Boer War. Born, 1836.

Chambers, Robert. Scottish editor, author, and publisher. With his brother, William, editor of *Chambers' Journal, Chambers' Encyclopedia, Chambers' Book of Days.* Born, 1802; died, 1872.

Chambers, William. Brother, partner, and collaborator with above. Born, 1800; died, 1885.

Channing, William Ellery. American Unitarian theologian and reformer; opponent of slavery. *Self-Culture; The Elevation of the Laboring Classes; Evidences of Christianity.* Born, 1780; died, 1841.

Charlemagne. King of France. Emperor of the West. Son of Pepin the Short; became master of the whole territory of the Franks in 771; crowned Emperor of the West, with the title of Cæsar Augustus, by Pope Leo III., 800. His empire extended from the Elbe to the Ebro, and from Calabria to Hungary. He was the founder of the Carlovingian line of kings. Born, 742; died, 814.

Charles V. (I. of Spain). Emperor of Germany and King of Spain; summoned the Diet of Worms to put down Luther in 1521; opposed the Protestants, but made concession to them by the treaty of Passau 1552; abdicated 1552, and withdrew to the monastery of St. Yuste, Spain. Born, 1500; died, 1558.

Charles XII. King of Sweden, 1697–1718. Soldier and conqueror. Peter the Great of Russia, Frederick IV. of Denmark, and Augustus of Poland made a league against him in 1700. He besieged Copenhagen, and forced Denmark to make peace; beat the Russians, and in the next campaign invaded Poland, where he compelled Augustus to resign; invaded Russia, and was defeated (1709) at Pultowa; found refuge in Turkey, from which he soon returned; invading Norway, he was killed at the siege of Frederickshalle. Born, 1682; died, 1718.

Charles the Bold. Duke of Burgundy. Warred with Louis XI. of France and Rene of Lorraine; killed fighting the Swiss allies of the latter. Born, 1433; died, 1477.

Chase, Salmon P. American statesman and jurist. Secretary of the Treasury. Chief Justice of the U. S. Born, 1808; died, 1873.

Chateaubriand, Francis A., Viscount of. French poet and prose writer. *Genie du Christianisme. Atala.* Born, 1768; died, 1848.

Chatham, William Pitt, First Earl of. English statesman and orator. "The Great Commoner;" entered Parliament, 1735; opposed Walpole's ministry; Premier, 1757; opposed taxation of the American Colonies. Born, 1708; died, 1778.

Chaucer, Geoffrey. English poet. *The Canterbury Tales; The Court of Love; Legend of Good Women; Troilus and Cresseide.* Born, 1328; died, 1400.

Cherubini, Maria L. C. Z. S. Italian musical composer. Among his works are *Medee, Elisa, Ali Baba,* and, in sacred music, the *Requiem.* Born, 1760; died, 1842.

Chesterfield, Philip D. Stanhope. English orator and wit. Noted for his exquisite manners, on which subject he was the oracle of his day. Born, 1694; died, 1773.

Child, Lydia Maria. American author and philanthropist. Editor "National Anti-slavery Standard." Born, 1802; died, 1880.

Childs, George W. American publisher and philanthropist. Noted for his honesty and benefactions. Born, 1829; died, 1896.

Choate, Rufus. American lawyer, orator, and statesman. Most eloquent advocate of his time; U. S. Senator from Massachusetts. Born, 1799; died, 1859.

Chopin, Frederick. Polish composer and pianist. His works are perhaps the best of piano music. Born, 1810; died, 1849.

Cicero, Marcus Tullius. Roman orator, statesman, and author. In his consulship suppressed the conspiracy of Catiline; went in exile in 58 B. C. but was recalled; was a Pompeian, but enjoyed the favor of Cæsar; was slain by soldiers under orders from Antony. His work *On Old Age* is perhaps the best known of his writings. Born, B. C. 103; died, 46.

Clay, Henry. American orator and statesman. Born in Virginia; Speaker of U. S. Congress, 1811; signed treaty of Ghent, 1815; elected Speaker, 1815, and thrice re-elected; Secretary of State, 1825; U. S. Senator, 1832–42; Whig candidate for President, 1844; re-elected to Senate, 1848. Born, 1777; died, 1852.

Clemens, Samuel L. American humorist, who under the pen name of "Mark Twain" contributed the richest humor of the century; *The Innocents Abroad; Following the Equator.* Born, 1835.

Cleopatra. Queen of Egypt. Joint sovereign of Egypt with her brother Ptolemy; was beautiful and accomplished, but voluptuous; lived with Cæsar at Rome (46–44); in 41, became the favorite of Mark Antony; at the battle of Actium she fled; escaped Augustus by killing herself with an asp. Born, B. C. 69; died, 30.

Cleveland, Grover. Twenty-second President of the United States. Born at Caldwell, New Jersey; went to Buffalo, and was admitted to the bar in 1859. In 1881 he was elected Mayor of Buffalo, and in 1882 became Governor of New York. He served two terms as President of the United States, 1885–1889 and 1893–1897, being defeated for the intervening term by Benjamin Harrison, the Republican candidate. Born, 1837.

Clinton, DeWitt. American statesman. Governor of New York; U. S. Senator; Federal candidate for President; promoter of the Erie Canal. Born, 1769; died 1828.

Cobden, Richard. English statesman and economist. Leader of the Anti-Corn Law League. Born, 1804; died, 1865.

Coleridge, Samuel Taylor. English poet and philosopher. *The Ancient Mariner;* with Wadsworth wrote *Lyrical Ballads;* published *Christabel; Biographia Literaria; Aids to Reflection;* was a slave to opium. Born, 1772; died, 1834.

Coligny, Gaspard de. French admiral. Huguenot leader; killed in the massacre of St. Bartholomew. Born, 1517; died, 1572.

Colt, Samuel. American inventor; Colt's revolver. Born, 1814; died, 1862.

Columbus, Christopher. Discoverer of America. Born in Genoa; expected by sailing westward to find India; left Palos (Aug. 3, 1492) with 3

vessels; discovered San Salvador Oct. 12; visited Cuba and Hayti; 1493 discovered Porto Rico and Jamaica; 1498 continent at mouth of Orinoco; 1502 Honduras; died in poverty and neglect. Born, 1436; died, 1506.

Comte, Auguste. French philosopher. Founder of Positivism. *Course of Positive Philosophy.* Born, 1798; died, 1857.

Confucius, (Kung-futse). Chinese philosopher and theologian. Came forward as a religious teacher at 22. His philosophy related to the present life only; had nothing to do with physics or metaphysics. His influence in the East has been enormous. Born, B. C. 551; died, 479.

Conger, Edwin H. American diplomatist. Congress, 1885-1891; Minister to Brazil, 1891-1895; to China, 1898. Rescued from "Boxer" siege in 1900 by allied forces. Born, 1843.

Conkling, Roscoe. American Republican, lawyer, and statesman. U. S. Senator from New York. Born, 1828; died, 1888.

Constantine I. ("The Great"). Roman Emperor (306–337). Removed the Capital of the Empire to Byzantium. Born, 272; died, 337.

Cook, Captain James. English circumnavigator of the globe, and discoverer. Killed by Hawaiians. Born, 1728; died, 1779.

Cooper, Peter. American philanthrophist. Founder of Cooper Union. Born, 1791; died, 1883.

Cooper, James Fenimore. American novelist. Among his works are *The Spy*, *The Pioneers*, *The Pilot*, *The Red Rover*, *The Last of the Mohicans*, *The Pathfinder*, *The Deerslayer*. Born, 1789; died, 1851.

Cope, Edward Drinker. American naturalist and comparative anatomist. One of the foremost palæontologists of the world. Editor *American Naturalist.* Born, 1840; died, 1897.

Copernicus, Nicholas. German astronomer. Demolished the Ptolemaic theory of the universe and demonstrated that the sun is the center of the universe in his great work *The Revolution of the Celestial Orbs.* Born, 1473; died, 1543.

Corday, Charlotte de. Slayer of Marat. Born, 1768; died, 1793.

Corelli, Marie. English novelist. A step-daughter of Charles Mackay, the poet. *Romance of Two Worlds*, *Barabbas*, *The Sorrows of Satan.* Born, 1864.

Cornell, Ezra. American philanthrophist. Founder of Cornell University. Born, 1807; died 1874.

Cortez, Hernando. Spanish conqueror of Mexico. Born, 1485; died, 1547.

Cornwallis, Charles. Noted British general. Surrendered to George Washington at Yorktown, 1781, thus practically closing the War for Independence. Born, 1738; died, 1805.

Cowper, William. English poet. Published his great work, *The Task*, in 1785. His letters are among the best in the language. Born, 1731; died, 1800.

Crane, Stephen. American author. *The Red Badge of Courage*, and other stories. Also noted war correspondent in 1898. Born, 1871; died, 1900.

Crawford, F. Marion. American novelist. Nephew of Julia Ward Howe. *Mr. Isaacs*, *Paul Patoff*, etc. Born, 1854.

Cranmer, Thomas. Archbishop of Canterbury. Reformer. Burnt as a Christian martyr. Born, 1489; died, 1556.

Crispi, Francesco. Italian statesman. A revolutionist with Garibaldi; Prime Minister of Italy 1887–90 and 1894. Born, 1819; died, 1901.

Crockett, David. American pioneer and hunter, famous for his bravery and eccentricities. Served several years in Congress; joined the Texan patriots in 1836 and was massacred by Mexicans at the Alamo. Born 1786; died, 1836.

Crœsus. King of Lydia. Famous for his wealth. Born, B. C. 590; died, 546.

Cromwell, Oliver. Lord Protector of England. Entered army as captain of cavalry, 1642; signed death warrant of Charles I., 1649; routed the Scotch at Dunbar, beat Charles at Worcester, 1651; dissolved Parliament, 1653; was created Protector, 1654. Born, 1599; died, 1658.

Cruikshank, George. English caricaturist. *Comic Almanack.* Born, 1792; died, 1878.

Curtis, George William. American orator, author and journalist. *Nile Notes; Potiphar Papers.* Born 1824; died, 1892.

Cushing, Caleb. American lawyer, diplomatist and statesman. Attorney-General of the United States; Minister to China. *The Treaty of Geneva.* Born, 1800; died, 1879.

Cushman, Charlotte S. American actress. Great as *Meg Merrilies.* Born, 1816; died, 1876.

Cuvier, George C. L. D., Baron de. French naturalist. *Animal Kingdom*, *Natural History of Fishes;* was founder of the science of comparative anatomy. Born, 1769; died, 1832.

Cyrus, The Great. Founder of the Persian Empire and greatest of Persian kings. Killed in battle 529 B. C.

Dallas, George M. American Democratic politician. Vice-President, 1845–49. Born, 1792; died, 1864.

Dalton, John. English natural philosopher. Propounder of the atomic theory. *New System of Chemical Philosophy.* Born, 1766; died, 1844.

Dana, Charles A. American journalist. Editor of the New York *Sun.* Born, 1819; died, 1898.

Dana, Richard Henry. American poet and man of letters. *The Buccaneer*, *The Dying Rover*, *The Idle Man.* Born, 1787; died, 1879.

Dana, Richard Henry. Son of the above. American lawyer and author. *Two Years Before the Mast.* Editor of *Wheaton's International Law.* Born, 1815; died, 1882.

Daniel. One of the four greater Hebrew prophets. Taken prisoner by Nebuchadnezzar. Highly honored by Kings Darius and Cyrus.

Dante degli Alighieri. Greatest Italian poet. *The Divine Comedy.* Passed much of his time in exile from Florence for political causes. Wrote *The New Life* (*Vita Nuova*), the *Convito*, treatise on the Italian language, *De Vulgari Eloquio*, and *De Monarchia.* Born, 1265; died, 1321.

Danton, George J. French Revolutionist. Head of the "Dantonists." Minister of Justice. Guillotined. Born, 1759; died, 1794.

Darius I. (Hystaspes). King of Persia. B. C., 521-485. Began the wars with the Greeks. His Satraps Datis and Artaphernes were defeated at Marathon. Born, B. C. ——; died, 485.

Darius III. (Codomannus). King of Persia. B. C. 336–330. Defeated and dethroned by Alexander the Great. Born, B. C. 380; died, 330.

Darwin, Charles R. English naturalist. Originator of the theory of evolution by natural selection. *Origin of Species; The Descent of Man; The Fertilization of Orchids.* Born, 1809; died, 1882.

David. King of Israel. Distinguished as general, statesman, poet and prophet. Lived 1090 to 1015 B. C.

Da Vinci, Leonardo. Italian painter, sculptor, engineer and universal genius. *The Lord's Supper.* Among his works are *Madonna, Lisa del Giocondo* and *The Virgin on the Knees of St. Anne.* Born, 1452; died, 1519.

Davis, Jefferson. American statesman; colonel in Mexican war, elected to U. S. Senate, 1847; Secretary of War, 1853–57; re-elected to Senate, 1857; President Southern Confederacy, 1861–65. Born, 1808; died, 1889.

Davis, Rebecca Harding, and her son, *Richard Harding.* American novelists. The latter also a spirited war correspondent in Cuba, 1898, and South Africa, 1900. Born, first, 1831; second, 1864.

Dawson, Sir J. William. Canadian geologist. An original investigator, writer, and teacher. Born, 1820; died, 1899.

Davy, Sir Humphrey. An English chemist of great eminence. President of the Royal Society; author many valuable scientific works. Born, 1778; died, 1829.

Decatur, Stephen. American naval officer. Distinguished himself in Tripoli, 1804, and in War of 1812 with England. Killed in duel. Born, 1779; died, 1820.

DeFoe, Daniel. English novelist. Produced his great work, *Robinson Crusoe,* in 1719; *Moll Flanders,* 1721; *Colonel Jack,* 1721. Born, 1661; died, 1731.

Demosthenes. Greatest Greek orator. Was an opponent of Philip of Macedon, against whom, between 352 and 340 B. C., he delivered his 11 *Phillipics.* It being proposed to give him a crown, Æschines opposed; this was the cause of the noblest speech of Demosthenes, that *On the Crown.* Born, B. C., 385; died, 322.

Depew, Chauncey M. American railway director, politician, and humorous orator; elected U. S. Senator in 1899. Born, 1834.

DeQuincey, Thomas. English author. Contracted opium habit. *Confessions of an Opium Eater.* Born, 1785; died, 1859.

Descartes, René. French philosopher and metaphysician. *Principles of Philosophy;* made many discoveries in algebra and geometry. Born, 1596; died, 1650.

Dewey, George. Admiral American Navy; hero of battle of Manila (1898); triumphant return to America in 1899. Born, 1837.

Dickens, Charles. English novelist. Published *Sketches by Boz,* 1836; *Pickwick Papers, Oliver Twist, Nicholas Nickelby, The Old Curiosity Shop,* etc. Born, 1812; died, 1870.

Diogenes. Greek cynic philosopher. Surly and independent inhabitant of a tub. Born, B. C., ——; died, 323.

Disraeli, Benjamin, Earl of Beaconsfield. English statesman and novelist. Premier (1874–1880). *Coningsby, Vivian Grey, Henrietta Temple, Endymion, Lothair.* Born, 1805; died, 1881.

Donnelly, Ignatius. American author and politician. Nominated for Vice-President People's Party ticket, 1900. *The Great Crytogram, Cæsars Column,* etc. Born, 1831; died, 1901.

Dore, Gustave. French painter and illustrator. Illustrated Dante's *Inferno, Don Quixote, Paradise Lost, Idylls of the King,* etc. Painted *Francesca de Rimini, Christ Leaving Prætorium,* etc. Born, 1832; died, 1883.

Douglas, Stephen A. American Democratic politician. Senator from Illinois. *The Kansas-Nebraska Bill.* Born, 1813; died, 1861.

Draco. Athenian legislator. Noted for the severity of his laws. Born, B. C. 7th century.

Drake, Sir Francis. English navigator and admiral. Preyed upon Spanish commerce; burned 100 Spanish vessels in Cadiz. Born, 1545; died, 1596.

Dreyfus, Albert. A French army officer. Persecuted because of his Jewish blood, as the scapegoat for criminal officers. Sentenced to perpetual imprisonment, 1894, but secured new hearing and was pardoned, 1899.

Drummond, Henry. British author and teacher. *Natural Law in the Spiritual World, The Ascent of Man, The Greatest Thing in the World,* etc. Born, 1851; died, 1897.

Dryden, John. English poet and dramatist. Appointed poet-laureate, 1670; produced *Absalom and Achitophel, Ode on Alexander's Feast, Fables.* Of his dramatic works, *All for Love* is the best. Born, 1631; died, 1700.

Dumas, Alexandre. French novelist. *The Three Musketeers.* Born, 1803; died, 1870.

Dumas, Alexandre (Jr.). French novelist and dramatist. *La Dame aux Camelias.* Born, 1824.

Du Maurier, George L. P. B. Born in Paris; satirical illustrator for *Punch;* novelist. *Peter Ibbetson, Trilby.* Born, 1834; died, 1896.

Eads, James Buchanan. American engineer. Built the St. Louis bridge; deepened the channel of the Mississippi. Born, 1820; died, 1887.

Ebers, George Moritz. German Egyptologist and writer. *An Egyptian Princess, Homo Sum, Cleopatra.* Born, 1837; died, 1898.

Eddy, Mary Baker Glover. American theologian. Founder of Christian Science. Author of *Science and Health,* etc.

Edison, Thomas Alva. A celebrated American inventor. Born at Milan, Ohio; started life as a newsboy; made important inventions in telegraphy, electric lighting, etc. Also invented the phonograph. Born, 1847.

Sir Wilfred Laurier
Sir John Thompson
Sir John Macdonald
Sir J. William Dawson
Sir Charles Tupper
· DISTINGUISHED MEN OF CANADA ·

Edward VII. King of England. Succeeded Queen Victoria in 1901. Born, 1841.

Edwards, Jonathan. American metaphysician. Ablest defender of Calvinism. *On the Freedom of the Will.* Born, 1703; died, 1758.

Eggleston, Edward. American novelist and historian; Minister of Methodist Church. *The Hoosier Schoolmaster*, and several historical works. Born, 1837.

Eliot, John. *The Apostle of the Indians.* American preacher and missionary to the Indians. Translated the Bible into Indian language. Born, 1604; died, 1690.

Elizabeth. Queen of England. Daughter of Henry VIII. Among the great events of her reign were the repulse of the Spanish Armada, and the execution of Mary Queen of Scots. Born, 1523; died, 1603.

Emin Pasha. An African explorer, of German birth; original name Edward Schnitzler. Entered the Egyptian service; governor of the equatorial province, 1878; cut off from world by the Mahdi outbreak; rescued by Henry M. Stanley in 1889; killed by Arabs in later travels. Born, 1840; died, 1892.

Emerson, Ralph Waldo. American transcendental philosopher and poet. Was for a time a Unitarian minister in Boston; *English Traits, The Conduct of Life, Poems, Society and Solitude, Essays.* Born, 1803; died, 1882.

Emmett, Robert. Irish patriot; Executed for treason. Born, 1780; died, 1803.

Epictetus. Greek Stoic philosopher and moralist. *Enchiridion.* Flourished in 2d century.

Epicurus. Greek philosopher. Founder of the Epicureans. Born, B. C. 342; died, 270.

Erasmus, Desiderius. Noted Dutch scholar. One of the most profoundly learned men of modern times. In 1570 became professor of Divinity and Greek at Cambridge. Works published in ten folio volumes. Born, 1465; died, 1536.

Eric the Red. Scandinavian navigator. Supposed to have discovered Greenland about 982, and his son, Lief Eric, is supposed to have visited New England about 1000.

Ericsson, John. Swedish engineer and inventor. In 1836 patented the first successful screw propeller. Immigrated to America. In 1861 built the iron-clad *Monitor*, revolutionizing the construction of warships. Born, 1803; died, 1889.

Euclid. Alexandrian mathematician. *Elements of Geometry.* Born B. C., 4th century.

Eugene, Francis, Prince of Savoy. One of the greatest generals of his time; co-operated with Marlborough at Blenheim, Oudenarde, and Malplaquet. Born, 1663; died, 1736.

Euripides. Third in merit of the great Greek tragedy writers. *Alcestis.* Born, B. C. 480; died, 406.

Evans, Marian (George Eliot). English novelist. *Scenes of Clerical Life, Adam Bede, The Mill on the Floss, Romola, Middlemarch*, etc. Born, 1820; died, 1880.

Evarts, William M. American lawyer and statesman. Attorney-General of the United States; Secretary of State. Born, 1816; died, 1901.

Everett, Edward. American orator, statesman and diplomatist. U. S. Senator; Minister to Great Britain. *Orations and Speeches.* Born, 1794; died, 1865.

Ezekiel. One of the four greater Hebrew prophets. Contemporary and fellow-prisoner in Babylon with Daniel. Lived about 600 B. C.

Faraday. Michael. English man of science. Founder of the science of magneto-electricity. *Experimental Researches in Electricity.* Born, 1791; died, 1867.

Farragut, David Glascoe. American Admiral. Entered navy 1812; commander, 1841; passed New Orleans forts and took New Orleans, 1862; made Rear Admiral same year; attacked defenses at Mobile, 1864; Admiral, 1866. Born, 1801; died, 1870.

Farenheit, Gabriel D. German natural philosopher. Fahrenheit's thermometer. Born, 1686; died, 1736.

Fawkes, Guy. An English conspirator. Principal in the Gunpower Plot to blow up the House of Parliament. Executed 1606.

Fenelon, Francois de Salignac. Noted French archbishop, author and orator. Among his works are *Telemachus, Maxims of the Saints, Dialogues on the Eloquence of the Pulpit*, etc. Born, 1651; died, 1715.

Fessenden, William Pitt. American Republican Senator, and Secretary of the Treasury. Born, 1806; died, 1869.

Field, Cyrus W. American capitalist. Laid the first Atlantic cable. Born, 1819; died, 1892.

Fielding, Henry. English novelist. *Tom Jones, Joseph Andrews, Jonathan Wild, Amelia.* Born, 1707; died, 1754.

Fillmore, Millard. American President, 1850–53. Born in New York; learned fuller's trade; studied law; member of Congress, 1832–42; elected Vice-President, 1848; became President on death of Taylor. Born, 1800; died, 1874.

Fish, Hamilton. American statesman. U. S. Congressman and Senator. Governor New York, 1847; Secretary of State under U. S. Grant, 1869 to 1877. Born, 1808; died, 1895.

Foote, Andrew Hull. American Rear-Admiral. Distinguished in Civil War. Born, 1806; died, 1863.

Ford, Paul Leicester. American author. *The Hon. Peter Sterling, Janice Meredith*, and *Biographies of Washington and Franklin.* Born, 1865. Died, 1902.

Forrest, Edwin. American tragedian. Eminent as *Metamora, the Gladiator, Virginius.* Born, 1806; died, 1872.

Fox, Charles James. English orator and statesman. Entered Parliament, 1768, as a Tory; opposed policy of Pitt. Born, 1749; died, 1806.

Fox, George. English religionist. Founder of the Society of Friends. Born, 1624; died, 1690.

Franklin, Benjamin. American statesman and philosopher. Born in Boston; learned printer's trade; removed to Pennsylvania; published *Poor Richard's Almanac;* discovered identity of lightning and electric fluid, 1752; deputy postmaster-general of the colony; agent of the Penns in England; delegate to Continental Congress;

Minister to France, 1776–85; President of Pennsylvania, 1785-87; member Constitutional Convention of 1787. Born, 1706; died, 1790.

Franklin, Sir John. English Arctic explorer. Lost in Arctic regions. Born, 1786; died, 1847.

Frederick II. ("The Great"). King of Prussia. Came to the throne in 1740, and invaded Silesia, which Maria Theresa ceded to him in 1742. Russia, France, and Austria began Seven Years' War against him and England (1756). He won a great victory at Prague (1757), but was defeated by Daun soon afterward; the same year defeated the French at Rossbach, and the Austrians at Leuthen. Peace was made in 1763. At the partition of Poland (1772) he got Prussian Poland. Born, 1712; died, 1786.

Freeman, Edward Augustus. English historian. Professor of Modern History at Oxford. *The Norman Conquest*, etc. Born, 1823; died, 1892.

Fremont, John Charles. American explorer, politician, and general. Republican candidate for President in 1856. Born, 1813; died, 1890.

Frœbel, Frederick. German educator. Introducer of the "Kindergarten" system. Born, 1782; died, 1852.

Froissart, Jean. French chronicler. *Les Chroniques.* Born, 1337; died, 1410.

Froude, James A. English historian. *History of Henry III., Short Studies on Great Subjects.* Born, 1818; died, 1894.

Fry, Elizabeth. English philanthropist. Devoted to prison reform. Born, 1780; died, 1845.

Fulton, Robert. American inventor of the steamboat. Built (1807) the steamer *Clermont*, which made regular trips between New York and Albany. Born, 1765; died, 1815.

Funston, Frederick. American soldier. Served in the Cuban rebellion and in the Philippines. Famous for his daring; captured Aguinaldo in 1901; rewarded with rank of brigadier-general. Born, 1865.

Gage, Lyman W. American financier. Secretary of Treasury under President McKinley. Born, 1836.

Galilei, Galileo. Italian astronomer. Professor of mathematics at Padua and Pisa. Discovered law by which the velocity of falling bodies is accelerated. Constructed a telescope in 1619. Published *Dialogues on the Ptolemaic and Copernican Systems.* Born, 1564; died, 1642.

Gall, Franz Joseph. German physician. Founder of the system of phrenology, and with Dr. Spurzheim, his pupil, lectured on the subject throughout Europe. Born, 1758; died, 1828.

Galvani, Louis. Italian physicist. Discoverer of galvanism. Born, 1737; died, 1798.

Gambetta, Leon. French radical orator and statesman. President of the Chamber of Deputies. Born, 1838; died, 1882.

Garfield, James A. American President. Born in Ohio; brigadier-general, 1862; major-general for services at Chickamauga; M. C., 1862-1881; elected to Senate, 1880; elected President, 1881; shot by Charles J. Guiteau, July 2, 1881; died September 19. Born, 1831; died, 1881.

Garland, Augustus H. American statesman. Member Confederate Congress, 1861-65; United States senator; Governor of Arkansas, 1874; Attorney-General of the U. S. under Cleveland, 1885. Born, 1832.

Garibaldi, Giuseppe. Italian patriot and general. Liberator of Italy. Born, 1807; died, 1882.

Garrick, David. English actor. Made his debut as *Richard III.* in 1741. Among his great parts were *Lear, Macbeth, Romeo, Hamlet, Abel Drugger;* buried in Westminster Abbey. Born, 1716; died, 1779.

Garrison, William Lloyd. American journalist and Abolitionist. Born at Newburyport, Mass.; at Boston, in 1831, he founded his celebrated *Liberator.* Born, 1804; died, 1879.

Gounod, Charles Francois. French composer. Of his operas *Faust* is the best known. Born, 1818; died, 1893.

Genghis, Khan. Great Mongolian warrior and conqueror. Subjugated China and Persia. Born, 1163; died, 1227.

George III. King of England. Lost American colonies; insane latter part of his life. Born, 1738; died, 1820.

George, Henry. American economist. Published *Progress and Poverty* in 1879. Advocated single tax on land. Twice candidate for Mayor of New York; died in 1897 before the election. Born, 1839; died, 1897.

Gibbon, Edward. English historian. *Decline and Fall of the Roman Empire.* Born, 1737; died, 1794.

Gladstone, William Ewart. Statesman, orator, and scholar. Born at Liverpool, son of a Liverpool merchant; educated at Eton and Oxford; entered Parliament in 1832; in 1859, under Lord Palmerston, became Chancellor of the Exchequer; in 1865, he became leader of the Commons under Lord John Russell; became Premier for the first time in 1869, holding office till 1875; in 1880, became Premier for the second time; a third time in 1886, and a fourth time in 1892; failed from desertion in the Liberal ranks to carry his measure of Home Rule for Ireland; retired from office into private life in 1895; author of several works. Born, 1809; died, 1898.

Godfrey of Bouillon. King of Jerusalem. Hero of the first Crusade. Born, 1058; died, 1100.

Goethe, John Wolfgang von. German poet, dramatist, critic, novelist, man of science, statesman. *Faust, Iphigenia in Tauris, Wilhelm Meister, Egmont, Sorrows of Werther,* and many noble lyrical poems. In almost every department of literature, first among the Germans. Born, 1749; died, 1832.

Goldsmith, Oliver. Irish poet, novelist, and historian. *Vicar of Wakefield, The Traveller, The Deserted Village.* Born, 1728; died, 1774.

Goodrich, Samuel G., "Peter Parley." American writer. *Peter Parley's Own Story.* Born, 1793; died, 1860.

Gordon, Charles George. English soldier and administrator. Overthrew the Taiping rebellion in China; entered the service of Egypt and became Governor of the Soudan; slain by the

troops of the Mahdi in Khartoum. Born, 1833; died, 1885.

Gough, John B. American temperance orator. Born, 1817; died, 1886.

Gracchus, Tiberius. Roman tribune and demagogue. Passed agrarian law; murdered. Born, B. C. 163; died, 133.

Grant, Ulysses S. American general and President. Born in Ohio; graduated at West Point, 1839; served in Mexican War; brigadier-general 1861; took Fort Donelson, 1862; Vicksburg, 1863; lieutenant-general, 1864; President, 1869–77. Born, 1822; died, 1885.

Gray, Thomas. English poet. Professor of modern history at Cambridge. *Pindaric Odes; Elegy Written in a Country Churchyard.* Born, 1716; died, 1771.

Greeley, Horace. American journalist and politician. Founded the *New York Tribune* in 1841. Till his death he advocated temperance, anti-slavery, socialistic, and protectionist principles; in 1872 he unsuccessfully opposed Grant for the Presidency. His works include *The American Conflict, Recollections, Essays,* etc. Born, 1811; died, 1872.

Gregory I., "The Great." Pope. Converter of Britain. Born, 545; died, 604.

Gregory VII. (Hildebrand). Greatest of the Popes. Elected Pope in 1073; the Emperor, Henry IV., of Germany, deposed him, and was excommunicated. After a humiliating penance at Canossa, Henry was pardoned, but the reconciliation was only temporary. Born, 1015; died, 1085.

Grey, Lady Jane. English lady. Distinguished for rare talents. Edward VI. made her his successor as sovereign, and because of her acceptance she was imprisoned in the Tower and afterwards executed. Born, 1537; died, 1554.

Grote, George. English historian. *History of Greece.* Born, 1794; died, 1871.

Guizot, Francois P. G. French statesman and historian. Minister of Foreign Affairs. *History of France.* Born, 1787; died, 1874.

Guillotine. Joseph Ignace. A French physician after whom the Guillotine was named; he having recommended it as a more humane method of capital punishment. Born, 1738; died, 1814.

Gustavus II. (Adolphus). King of Sweden. General. Began to reign in his seventeenth year; soon afterward defeated the Czar and the King of Poland; invited to become the head of the Protestant party in Germany, he entered Pomerania with 8,000 men, and took town after town; defeated (1631) Marshal Tilly at Leipzig, and the next year on the banks of the Lech, where Tilly was slain. The Emperor now called in the great Wallenstein to oppose Gustavus; the two generals met at Lutzen; Gustavus was mortally wounded, but the imperial army under Wallenstein was repulsed. Born, 1594; died, 1632.

Gutenburg, Johannes or Henne, also called Gensfleisch. Claimed by the Germans to have been the inventor of the art of printing with movable types; he set up his first printing-press at Mainz about 1450. Born, 1400; died, 1468.

Hæckel, Ernst Heinrich. German naturalist and evolutionist. Made valuable researches on the lower animals; wrote popular works on science. Born, 1834.

Hahnemann, Samuel C. F. German founder of homœopathy. Proposed homœopathy, 1796; published *Organum of Rational Medicine,* 1810. Born, 1755; died, 1843.

Hale, Edward Everett. American author and Unitarian minister. *The Man Without a Country,* etc. Born, 1822.

Halleck, Fitz-Greene. American poet. *Marco Bozzaris.* Born, 1790; died, 1867.

Hamilton, Alexander. American statesman and financier. Born in Island of Nevis, West Indies. Aide-de-camp and secretary to Washington in Revolutionary War; leading member of the Convention of 1787; principal author of the *Federalist;* Secretary of the Treasury, 1789–95; killed in a duel by Aaron Burr. Born, 1757; died, 1804.

Hamilton, Sir William. Scotch metaphysician. Born, 1788; died, 1856.

Hampton, Wade. American general and Senator. Governor South Carolina in 1876; U. S. Senator, 1878. Born, 1818.

Hancock, John. American Revolutionary statesman; President of the Continental Congress. Born, 1737; died, 1793.

Hancock, Winfield S. American general. Commanded at Gettysburg; Democratic candidate for President in 1880. Born, 1824; died, 1886.

Handel, George F. German composer. Composed sonatas at ten. His oratorio of *Saul* was produced, 1740; his masterpiece, the *Messiah,* 1741. Among his other works are *Moses in Egypt, Samson,* and *Jepthah.* Born, 1684; died, 1739.

Hannibal. Carthaginian general against Rome. Son of Hamilcar, who swore him to eternal enmity with the Romans; captured Saguntum, 219 B. C.; crossed the Alps, 218; destroyed Roman army at Cannæ; defeated by Scipio at Zama, 202; finally poisoned himself to escape falling into the hands of the Romans. Born B. C. 247; died, 183.

Harris, Joel Chandler. An American writer; born in Georgia. Author of *Uncle Remus.* and other folklore stories. Born, 1848.

Harrison, Benjamin. Twenty-third President of the United States. Was born at North Bend, Ohio; graduated from Miami University in 1852; began the practice of law in Indianapolis. Served in the Union army during the Civil War; entered United States Senate in 1881; served one term as President of the United States, 1889–1893; defeated for second term. He was the grandson of William Henry Harrison, ninth President of the United States. Born, 1833; died, 1901.

Harrison, William Henry. American President. General; Governor of Indiana, 1801–13, defeated Indians at Tippecanoe; elected to Congress, 1817; to the Senate, 1824; Minister to Columbia, 1828; Whig candidate for President, 1836; elected President, 1840. Born, 1773; died, 1841.

Harte, Francis Bret. American novelist and poet. *The Heathen Chinee; Gabriel Conroy; Luck of Roaring Camp.* Born, 1839. Died, 1902.

Harvard, John. Colonial divine. Benefactor of Harvard College, which was given his name. Born, 1608; died, 1688.

Harvey, William. English physician. Discoverer of the circulation of the blood. Born, 1578; died, 1657.

Hastings, Warren. British statesman and general; President of the Council of Bengal; conqueror of Hyder Aly; impeached for cruelty, but acquitted. Born, 1733; died, 1818.

Hawthorne, Nathaniel. American romance writer. *Marble Fawn; The Scarlet Letter; The House of Seven Gables; The Blithdale Romance; Mosses from an Old Manse.* Born, 1804; died, 1864.

Haydn, Francis Joseph. German composer. Between the ages of nineteen and twenty-six, composed many sonatas, concertos, and symphonies; produced 1798, his masterpiece, *The Creation.* Born, 1732; died, 1809.

Hayes, Rutherford B. American President. Born in Ohio; admitted to bar, 1845; brigadier-general in Civil War; entered Congress at its close; re-elected, 1866; Governor of Ohio, 1868–76; President United States, 1877–81. Born, 1822; died, 1893.

Hayne, Robert T. American lawyer and Senator. Governor of South Carolina; opponent of Webster in discussing the Constitution and State rights. Born, 1791; died, 1839.

Hegel, George W. F. German philosopher. Professor of philosophy at Heidelberg and Berlin. He developed his system of philosophy in the *Enclyclopædia of Philosophical Science.* Born, 1770; died, 1831.

Heine, Heinrich. German lyric poet and satirist. *Reisebilde; Lieder.* Born, 1799; died, 1856.

Helmholtz, Hermann von. German physicist. Famous for his researches in physiology, surgery, light, sound, etc. Born, 1821; died, 1894.

Henry IV. "The Great." (Henry of Navarre.) King of France. Won battle of Ivry; issued Edict of Nantes. Born, 1553; died, 1610.

Henry V. King of England. Conqueror at Agincourt. Born, 1388; died, 1422.

Henry VIII. King of England. "Defender of the Faith." Suppressed the monasteries; founded the Church of England. Born, 1491; died, 1547.

Henry, Patrick. American orator and revolutionary patriot. "Give me Liberty, or give me Death." Born, 1736; died, 1799.

Herodotus. Greek historian. *History.* Born, B. C. 484; died, 408.

Herschel, Sir William. English astronomer. Discoverer of Uranus. Born, 1738; died, 1822.

Herschel, Sir John F. W. English astronomer. *Preliminary Discourse on the Study of Natural Philosophy.* Born 1792; died, 1871.

Higginson, Thomas Wentworth. An American author and abolitionist. During the Civil War he commanded the first regiment of freed slaves; subsequently he resumed literary work. *History of the United States; Army Life in a Black Regiment,* etc. Born, 1823.

Hirsch, Baron Maurice de. Jewish financier and philanthropist. Born, 1830; died, 1896.

Hobart, Garrett A. Vice President U. S. with McKinley, 1896. Born, 1844; died, 1899.

Hogarth, William. English painter. *The Rake's Progress.* Born, 1697; died, 1764.

Holmes, Oliver Wendell. American poet, physician, and novelist. *Elsie Venner; The Autocrat of the Breakfast Table; The Guardian Angel; Poems.* Born, 1809; died, 1897.

Homer. Greek epic poet. *Iliad* and *Odyssey.* The times of his birth and death are uncertain, and his existence is doubted by some, who maintain that the *Iliad* and *Odyssey* are collections of songs by different authors. Born, B. C. 10th century.

Hood, Thomas. English poet and humorist. *Song of the Shirt, Whims and Oddities, Eugene Aram's Dream.* Born, 1789; died, 1845.

Hooker, Joseph. American general. Commander of the Army of the Potomac, 1863; defeated at Chancellorsville. Born, 1815; died, 1879.

Horace (Q. Horatius Flaccus). Latin poet and satirist. *Odes, Epistles, Satires.* Born, B. C. 65; died, 8.

Houston, Samuel. American general and statesman. Commander-in-chief of the Texan army; captured Santa Anna; Governor of Texas. Born, 1793; died, 1863.

Howard, John. English philanthropist and prison reformer. *The State of the Prisons in England.* Born, 1726; died, 1790.

Howe, Elias. American inventor. Invented the sewing machine. Born, 1819; died, 1867.

Howe, Julia Ward. American author and editor. Advocate of Woman's Suffrage. Made famous by her *Battle Hymn of the Republic.* Born, 1819.

Howells, William Dean. American novelist. *A Chance Acquaintance, A Foregone Conclusion, A Modern Instance, An Indian Summer,* are among his more popular works. Born, 1837.

Hugo, Victor. French poet, dramatist, and novelist. *Les Miserables; Notre Dame.* Born, 1802; died, 1885.

Humboldt, F. H Alexander von. German naturalist. *Cosmos, an Essay of a Physical Description of the Universe,* etc. Born, 1769; died 1859.

Humbert I. King of Italy. Succeeded to the throne in 1878; assassinated by an anarchist in 1900. Born, 1844; died, 1900.

Hume, David. Scottish philosopher and historian. *History of England, Enquiry into the Principles of Human Nature.* Born, 1711; died, 1776.

Huss, John. Bohemian reformer. *On the Church.* Was burned at the stake. Born, 1376; died, 1415.

Ibsen, Henrik. Norwegian dramatist. Famous for his plays on sociological subjects. *A Doll's House, The Master Builder,* etc. Born, 1828.

Ingelow, Jean. English poet and novelist. *Tales of Orris, A Story of Doom and other Poems.* Born, 1830; died, 1897.

Innocent III. One of the greatest of the Popes. Elected Pope in 1198; put France under the ban, 1199, because Philip Augustus repudiated his queen; Innocent compelled him to take her

back. He organized the fourth Crusade, which resulted in the capture of Constantinople; in 1214 he crushed the Albigensians. Born, 1161; died, 1216.

Irving, Sir Henry (John Henry Brodribb). English actor in Shakesperean and modern roles; knighted in 1895. Born, 1838.

Irving, Washington. American author. Minister to Spain, 1842. *History of New York, The Conquest of Granada, Life of Washington, Columbus, The Sketch Book.* Born, 1783; died, 1859.

Isabella. "The Catholic" Queen of Castile. Patroness of Christopher Columbus. Born, 1451; died, 1504.

Ito, Hirobumi, Marquis. Japanese statesman. Premier of Japan; Admiral of Japanese fleet and gained great victory over China, Sept, 1895, off the Yalu River; Prime Minister again, 1900; resigned, 1901. Born, 1840.

Jackson, Andrew. American President and general. Born in North Carolina; began to practice law at Nashville, Tenn., 1788; M. C., 1796; Senator, 1797; Judge Tennessee Supreme Court, 1798–1804; defeated Creek Indians, 1814; won battle of New Orleans, 1815; in Seminole War, 1817–18; Senator, 1823; President, 1829–37. Born, 1767; died, 1845.

Jackson, Thomas J. ("Stonewall.") American Confederate general. Captured Harper's Ferry taking 11,000 prisoners; defeated Banks; accidentally killed by his own soldiers. Born, 1826; died, 1863.

James, Henry. American novelist. *The American, Daisy Miller, Portrait of a Lady,* etc. Born, 1843.

James I. of England and VI. of Scotland. Son of Mary Queen of Scots. Succeeded Elizabeth to the throne of England 1603. Translation of Bible made under his direction, and known as King James' Version. Born, 1566; died, 1625.

Jay, John. American jurist, diplomatist, and statesman. Negotiated treaty with England. Born, 1754; died, 1829.

Jefferson, Joseph. American actor. Great as *Rip Van Winkle.* Born, 1829.

Jefferson, Thomas. American statesman and President. Born in Virginia, studied law; member Virginia House of Burgesses; in Continental Congress, 1775; drew up Declaration of Independence, 1776; Governor of Virginia, 1779–81; Resident Minister at Paris, 1785–89; Secretary of State, 1789–93; Vice-President, 1797–1801; President, 1801–9. Born, 1743; died, 1826.

Jeffrey, Francis, Lord. Scotch judge and critic. Editor of the *Edinburgh Review.* Born, 1773; died, 1850.

Jeanne D'Arc (The Maid of Orleans). A peasant girl in Lorraine; believing herself inspired by Heaven to raise the siege of Orleans and crown Charles at Rheims, she set out to the king in 1429, was given a command, raised the siege of Orleans in one week, won the battles of Jargeau and Patay, and Charles was crowned at Rheims. Taken in a skirmish by the Burgundians, she was delivered to the English and burned as a sorceress. Born, 1411; died, 1431.

John. King of England. Granter of Magna Charta. Born, 1166; died, 1216.

John III. (John Sobieski.) King of Poland. Expelled the Turks from Austria and Poland. Born, 1629; died, 1696.

Johnson, Andrew. American President. In Congress, 1843–53; Governor of Tennessee, 1853–7; U. S. Senator, 1857; Military Governor of Tennessee, 1862; elected Vice-President, 1864; President on death of Lincoln, April 15, 1865; impeached, but acquitted, 1868; subsequently re-elected to the Senate. Born, 1808; died, 1875.

Johnson, Samuel. English poet, critic, and scholar. Born in Lichfield; educated at Oxford; published *London, Life of Richard Savage, Vanity of Human Wishes, Dictionary, Rasselas, Lives of the Poets.* Born, 1709; died, 1784.

Johnston, Albert Sydney. American Confederate general. Attacked Grant at Shiloh, and was killed. Born, 1803; died, 1862.

Johnston, Joseph E. American general. Served with distinction in Mexico. In 1861, joined Confederate army, in which he distinguished himself. Born, 1807; died, 1891.

Jones, John Paul. American Revolutionary naval officer. Naval victories over British. Born, 1747; died, 1792.

Jonson, Ben. English poet and dramatist, bricklayer and soldier. *Every Man in his Humor, Volpone, The Alchemist, The Silent Woman, Sejanus; Masques.* Born, 1574; died, 1637.

Josephine. Widow of Alexander de Beauharnais. Wife of Napoleon I.; Empress of France; divorced. Born, 1763; died, 1814.

Josephus, Flavius. Jewish historian. *History of the Jews.* Born, 35; died, 100.

Joubert, Petrus Jacobus. A Boer soldier. Defeated the English in 1881 and Dr. Jameson in 1896; prominent in Boer-English war. Born, 1831; died, 1900.

Julian. "The Apostate." Roman emperor. Restored Pagan worship. Born, 331; died, 363.

Juvenal (Decimus Junius Juvenalis). Latin satirist. *Satires.* Born, 40; died, 125.

Kane, Elisha K. American Arctic explorer. *Arctic Explorations.* Born, 1820; died, 1857.

Kant, Immanuel. German philosopher. *Critique of Pure Reason.* In his *Universal Natural History and Theory of the Universe* he anticipated the discovery of Uranus. Another of his important works is the *Critique of Practical Reason.* It was his aim to determine the laws and limits of human reason and of the human intellect in relation to the objects of human knowledge. Born, 1724; died, 1804.

Kean, Edward. English actor. Among his greatest parts were *Shylock, Richard III., Othello, Iago, King Lear.* Born, 1787; died, 1833.

Keats, John. English poet. Born in London; apprenticed to a surgeon; died at Rome. *Endymion, Hyperion, The Eve of St. Agnes.* Born, 1795; died, 1821.

Kelvin, William Thomson, Lord. Scotch physicist. Famous for his discoveries in electric and dynamic

science, and researches on wave-motion and the ether. Created Lord Kelvin in 1892. Born, 1824.

Kempis, Thomas à. German ascetic writer. *Imitatio Christi.* Born, 1380; died, 1471.

Kepler, John. German astronomer. Discovered the mathematical laws of the solar system. Born, 1571; died, 1630.

Key, Francis Scott. American song-writer. *Star-Spangled Banner.* Born, 1799; died, 1843.

Kingsley, Charles. English divine and novelist. *Hypatia, Westward Ho, Hereward.* Born, 1819; died, 1875.

Kingsley, Henry. English novelist. *Ravenshoe.* Born, 1830; died, 1876.

Kipling, Rudyard. Story-teller and poet. Born in Bombay, and educated in England. His *Soldiers Three,* and other stories, gained for him an immediate and wide reputation. As a poet, his most successful effort is his *Barrack-Room Ballads.* Born, 1865.

Kitchener, Lord Horatio Herbert. English soldier. Hero of Soudan Campaign in 1898. Boer War 1899 and 1900. Born, 1850.

Knox, John. Scotch Reformer. Fierce anti-Catholic. *The First Blast of the Trumpet.* Born, 1505; died, 1572.

Koch, Robert. German bacteriologist. Born at Klausthal, in Hanover; famous for his researches in bacteriology; discovered sundry bacilli, among others the cholera bacillus and the phthisis bacillus, and a specific against it. Born, 1843.

Kosciusko, Thaddeus. Polish patriot and general. Commander of the Polish insurgent army; defeated at Warsaw, which he bravely defended. Born, 1745; died, 1817.

Kossuth, Louis. Hungarian orator and patriot. Leading spirit in the insurrection of 1848-49; effected many important reforms. Born, 1802; died, 1894.

Kropotkine, Prince Peter. Russian Nihilist. Arrested in Russia and escaped; imprisoned in France. Wrote *Paroles d'un Revolte, In Russian and French Prisons.* Born, 1842.

Kruger, Stephanus Johannes Paul. President of the South African Republic after 1883. Declared war against England in 1899. Went for aid to Europe in 1900. Born, 1825.

La Fayette, Marie J. P. R. P. Gilbert Motier, Marquis de. Joined American army as major-general, 1777; commanded advance guard of Washington at Yorktown; commander of French national guard, 1789; revisited America, 1824; took part in revolution of 1830. Born, 1757; died, 1834.

Lamarck, Jean Baptiste de. French naturalist. Famous for his theory of animal evolution. *Philosophie Zoologique.* Born, 1744; died, 1829.

Lamb, Charles. English author and humorist. *Essays of Elia; Essays on Tragedies of Shakespeare,* etc. Born, 1775; died, 1834.

Landseer, Sir Edwin. English painter. *The Old Shepherd's Chief Mourner.* Born, 1802; died, 1873.

Laplace, Pierre Simon, Marquis of. Great French mathematician and astronomer. Discovered the theory of Jupiter's satellites and the causes of the acceleration of the moon's mean motion, and of the inequality of Jupiter and Saturn. His *Exposition of the System of the universe* is a popular form of his great work *La Mecanique Celeste.* He was one of the greatest mathematicians and astronomers. Born, 1749; died, 1827.

Latimer, Hugh, Bishop of Worcester. English reformer. Burned. Born, 1480; died, 1555.

Laurier, Sir Wilfred. Canadian Premier after 1896. The First French Canadian to attain the honor. Elected in 1871 as a Liberal to the Quebec Provincial Assembly; in 1874 to the Federal Assembly. He stood first among the Colonial representatives at Queen Victoria's Diamond Jubilee in 1897. Born, 1841.

Law, John. Scotch financier in France. Promoter of the "South Sea Bubble." Born, 1671; died, 1729.

Lawrence, James. American naval commander. Commander of the *Chesapeake;* killed fighting the British *Shannon.* "Don't give up the ship." Born, 1781; died, 1813.

Layard, Sir Henry Austin. Assyrian excavator. He made wonderful discoveries at the site of Nineveh, and wrote *Nineveh and its Remains,* etc. Born, 1817; died, 1894.

Lecky, William Edward Hartpole. English historian. *Rationalism in Europe, European Morals, England in the 18th Century.* Born, 1838.

Lebrun, Charles. French painter. *The Family of Darius.* Born, 1619; died, 1690.

Lebrun, Charles Francois, Duke of Placentia. French politician. Third consul; Governor-General of Holland. Born, 1739; died. 1824.

Lee, Arthur. American statesman and diplomatist. Member of Congress; Minister to France. Born, 1740; died, 1792.

Lee, Fitzhugh. American general, Confederate soldier, Consul-General to Cuba. Commanded a division in Cuba during reconstruction. Born, 1835.

Lee, Francis Lightfoot. American Revolutionary patriot. Member Congress; signed Declaration of Independence. Born, 1734; died, 1797.

Lee, Henry. American Revolutionary soldier. "Light Horse Harry." Served under Greene; Governor of Virginia. Born, 1756; died, 1818.

Lee, Richard Henry. American Revolutionary statesman. Signed Declaration of Independence; President of Congress; U. S. Senator. Born, 1732; died, 1794.

Lee, Robert Edward. American Confederate general. Commander-in-chief of Confederate army. Born, 1807; died, 1876.

Leibnitz, Godfrey William, Baron. German mathematician and philosopher. In 1676 he discovered the infinitesimal calculus, about which he had a bitter dispute with Newton. In his treatise *Protogæa* (1693) he anticipated many of the discoveries of modern geology. In his *New Essay on the Human Understanding* he opposes Locke. Born, 1646; died, 1716.

Leicester, Robert Dudley, Earl of. Favorite of Queen Elizabeth; commander of the English contingent in the Netherlands. Born, 1532; died, 1588.

Lely, Sir Peter. German portrait painter in England. Painter to Charles II. Born, 1617; died, 1680.

Leonidas. King of Sparta. Leader of the Three Hundred at Thermopylæ. Born, B. C. —; died, 480.

Leopold, I Surnamed *The Great.* Emperor of Germany; waged fierce wars with the Turks for a long period of years, beginning in 1664. His last great battles were in Italy, and his troops played an important part in the decisive battle of Blenheim, 1704. Born, 1640; died, 1705.

Le Sage, Alain Rene. French novelist. *Gil Blas.* Born, 1668; died, 1747.

Lessing, Gotthold Ephraim. German critic and poet. *Laocoon; Nathan the Wise.* Born, 1729; died, 1781.

Lever, Charles. Irish novelist. *Charles O'Malley, Harry Lorrequer.* Born, 1806; died, 1872.

Li Hung-Chang. Chinese statesman. He aided Gordon in suppressing the Taiping rebellion; made governor-general of Chang, 1864; of Chi-li, 1872; founded the Chinese navy; commander-in-chief in the war with Japan, 1894; made treaty of peace; visited Europe and America 1896; selected to deal with the western powers after the Boxer outbreak of 1900. Born, 1828.

Lincoln, Abraham. President of the United States, 1861–1865. Born in Kentucky; afterwards removed to Illinois; captain in Black Hawk War; admitted to Illinois bar, 1836; Whig M. C., 1846; unsuccessful candidate for Senator against Douglas, 1856; elected President, 1860; re-elected, 1864; assassinated by J. Wilkes Booth, April 14, 1865; died April 15. Born, 1809; died, 1865.

Lind, Jenny. Celebrated Swedish singer. At 16 years the favorite opera singer of her native land; toured the world with marvelous success. Born, 1821; died, 1887.

Linnæus, Charles von. German botanist. Studied medicine and natural history. *System of Nature, Genera of Plants; Philosophia Botanica, Species Plantarum.* Designated each species of plants by adding single epithet to name of genus. Born, 1707; died, 1778.

Liszt, Franz. Celebrated Hungarian pianist. Born, 1811; died, 1886.

Livingstone, David. African explorer. *Narrative of an Expedition to the Zambesi.* Born, 1817; died, 1873.

Livy. (Titus Livius.) Roman historian. Famous for the rare style of his *History of Rome.* Born, B. C. 59; died, A. D. 17.

Locke, John. English philosopher. *Human Understanding.* Born, 1632; died, 1704.

Longfellow, Henry Wadsworth. American poet. *Hyperion, Ballads and other Poems, The Spanish Student, The Belfry of Bruges, Evangeline, The Golden Legion, Hiawatha, Miles Standish, Tales of a Wayside Inn.* Born, 1807; died, 1882.

Louis XIV. King of France. Son of Louis XIII. and Anne of Austria. Fought England, Austria, Spain, and Belgium, and engaged in the war of the Spanish Succession; was a patron of literature and the arts. Born, 1638; died, 1715.

Louis XVI. King of France. Married Marie Antoinette, 1770; succeeded Louis XV., 1774; imprisoned by the revolutionists; guillotined. Born, 1754; died, 1793.

Louis Philippe. King of France. "The citizen king." Abdicated in 1848. Born, 1773; died, 1850.

Lowell, James Russell. American poet, critic and diplomatist. *The Bigelow Papers, The Vision of Sir Launfal, The Commemoration Ode, Fable for Critics, The Cathedral, Among my Books, My Study Windows.* Minister to Spain and England. Born, 1819; died, 1891.

Loubet, Emile. President of France. He studied the law; was elected deputy in 1876; Senator in 1885; became Premier in 1892; President of the Senate in 1896, and succeeded M. Faure as President of the Republic of France in 1899. Born, 1839.

Loyola, Ignatius. He founded the Society of Jesus, with the object of renovating the Church and converting the infidels; left a devotional work called *Spiritual Exercise.* Born, 1491; died, 1536.

Lubbock, Sir John. English banker and naturalist; member Parliament. *The Origin of Civilization.* Born, 1834.

Lucian. Greek essayist and satirist. Famous for his delightful style and fine humor. *Dialogues of the Dead; True Histories.* Born, 125; died, 180.

Luther, Martin. German reformer. Became a priest in 1507; published (1517) ninety-five propositions against indulgences; burnt the Pope's Bull at Wittenburg. Justification by faith was the central point of his theology. Born, 1483; died, 1546.

Lycurgus. Spartan legislator. Instituted community of property and double executive at Sparta in the 9th century. Born, B. C. 850; died, —.

Lyell, Sir Charles. English geologist. Founded the uniformcan theory of geology. *Principles of Geology.* Born, 1797; died, 1875.

Lyttelton, Sir Thomas. English lawyer and judge. *Tenures.* Born, 1420; died, 1481.

Lytton, Sir Edward G. E. Lytton Bulwer, Baron. English novelist and dramatist. *The Caxtons; Richelieu.* Born, 1805; died, 1873.

Lytton, Lord Edward Robert Bulwer. ("Owen Meredith.") English statesman and novelist. *Lucille.* Born, 1831.

Macaulay, Thomas Babington, Lord. English historian and essayist. *History of England, Essays, Lays of Ancient Rome.* Born, 1809; died, 1859.

Maclaren, Ian (*nom de plume* of Rev. John Watson). Was minister of the Free Church in Logiealmond, and in Glasgow and Liverpool. *Beside the Bonnie Briar Bush,* etc. Born, 1850.

Macdonald, Sir John Alexander. Regarded as Canada's greatest statesman; organizer of the first government of the Dominion and its first Prime Minister. Born, 1815; died, 1891.

MacMaster, John Bach. American historian. Professor American history, University of Pennsyl-

vania. *History of the People of the United States*, etc. Born, 1852.

McCarthy, Justin. An Irish author and statesman. Leader of his party in House in Parliament, 1890 to 1896. *A History of Our Own Times*, *History of the Four Georges*, and a number of popular novels. Born, 1830.

McClellan, George B. American general. Won battle of Antietam in the Civil War. Born, 1826; died, 1885.

McKinley, William. American statesman; served in the Civil War; entered Congress in 1877; passed in 1890 a tariff measure named after him; was elected to the U. S. Presidency as the champion of a sound currency in opposition to Mr. Bryan in November, 1896, and again in November, 1900. Born, 1844; assassinated, 1901.

Madison, James. American President. Member of the Virginia Legislature, of the convention of 1787, and a strenuous advocate of the Constitution; joint author with Hamilton and Jay of the *Federalist;* M. C., 1789–97; Secretary of State, 1801–9; President, 1809–17. Born, 1751; died, 1836.

Magellan, Ferdinand de. Portuguese navigator. Magellan's Straits is named after him. Born, 1470; died, 1521.

Mahan, Alfred Thayer. An American naval officer and writer. *Influence of Sea Power upon History.* Born, 1840.

Mahomet. Arabian prophet. Founder of Mohammedanism. When 40 years of age, receiving a pretended revelation from Allah, he devoted himself to the propagation of a new religion. His faith was rejected at Mecca, but taken up at Medina. He fled from Mecca 622 (The Hegira); was originally a monogamist, and at first asserted liberty of conscience. Born, 570; died, 632.

Mandeville, Sir John. English traveler in the East. Often called the first English prose writer. Born, 1300; died, 1372.

Mann, Horace. American educationist. Member of Congress; President of Antioch College. Anti-slavery advocate. Born, 1796; died, 1859.

Marat, Jean P. French Revolutionist. Assassinated. Born, 1744; died, 1793.

Marconi, Guglielmo. Italian electrician. Discovered a practical system of telegraphing without wires. Born, 1875.

Maria Theresa. Empress of Austria and Queen of Hungary. Her husband, Francis, Duke of Lorraine, was chosen Emperor in 1745, but she was the real power; took part in the Seven Years' War; abolished feudal service. Born, 1717; died, 1780.

Marion, Francis. American general and patriot. Noted for his guerilla warfare against the British during the Revolutionary war. Born, 1732; died, 1795.

Marlborough, John Churchill, Duke of. English commander. Made Earl of Marlborough, 1689; commanded English forces in Low Countries, 1689; deposed for his Jacobite intrigue, 1692; restored, 1696; commander of allied armies in Holland, 1702; won battle of Blenheim, 1704; Ramillies, 1706; Malplaquet, 1709. His wife was the confidante of Queen Anne. In disgrace from 1711 till accession of George I. Born, 1650; died, 1722.

Marlowe, Christopher. English poet and dramatist. Born, 1564; died, 1593.

Marshal, John. Chief Justice of the United States. Captain in the Revolutionary War, at the close of which he began to practice law in Virginia; a member of the Virginia Convention (1788); in 1797, with Pickney and Gerry, he went on a diplomatic mission to France; elected to Congress in 1799; appointed Secretary of State 1800, and resigned that office to become Chief Justice. Was the greatest judge that ever held the latter office. Born, 1755; died, 1835.

Maartens, Maarten. Dutch novelist. Wrote in English *God's Fool*, *My Lady Nobody*, etc. Born, 1858.

Mary. Queen of England. Married Philip II. of Spain. Persecutor of the Protestants. Born, 1516; died, 1558.

Mary Stuart. Queen of Scots. Daughter of James V. Was invited to the throne of Scotland (1560.) Compelled to take refuge in England, she was finally beheaded by Elizabeth on a charge of conspiracy. Born, 1542; died, 1587.

Mathew, Theobald. "Father Mathew." Irish temperance reformer. Born, 1790; died, 1856.

Mazzini, Guiseppe. Italian patriot. Co-operated with Garibaldi; founder of Young Italy. Born, 1808; died, 1872.

Meade, George G. American general. Won battle of Gettysburg. Born, 1815; died, 1872.

Medici, Catherine de'. Queen of Henry II. of France. Instigated massacre of St. Bartholomew. Born, 1519; died, 1589.

Medici, Lorenzo de'. Grand Duke of Florence. "The Magnificent." Patron of art and literature; adorned Florence. Born, 1448; died, 1492.

Meissonier, Jean Louis Earnest. French painter. Distinguished for his highly finished small works. *The Chess Players; Freedland or 1807.* Born, 1813; died, 1891.

Mendelssohn-Bartholdy, Felix. German composer. Among his most famous works are his *Songs Without Words.* Born, 1809; died, 1847.

Mesmer, Frederick B. Suabian physician. Founder of Mesmerism. Born, 1731; died, 1815.

Meyerbeer, James. German composer. *Romilda e Costanza*, 1818; *Semiramide Riconosciula*, 1819; *Crociato in Egypto*, 1824; *Robert le Diable*, 1831; *Huguenots*, 1836; *L'Etoile du Nord*, 1854. Born, 1791; died, 1864.

Mezzofanti, Guiseppe G., Cardinal. Italian linguist. Born, 1774; died, 1849.

Michael Angelo (Buonarotti). Italian painter, sculptor, and architect. Painted the fresco of the *Last Judgment*, and prophets, sibyls, etc., at the Sistine Chapel. Among his great sculptures are the gigantic marble *David* and *Moses;* was appointed architect of St. Peter's, and formed a model for the dome; wrote sonnets and poems. Born, 1474; died, 1564.

Miles, Nelson A. American General-in-chief of the United States army in Spanish War. Received surrender of Porto Rico. Won fame in Civil War. Captured Jefferson Davis. Born, 1839.

Mill, John Stuart. English political economist and philosopher. *Logic, Political Economy, Examination of Sir W. Hamilton's Philosophy.* Born, 1806; died, 1873.

Millais, Sir John E. English painter. *Return of the Dove to the Ark.* Born, 1829; died, 1896.

Miller, Hugh. Scotch geologist. *Old Red Sandstone.* Born, 1802; died, 1856.

Miltiades. Athenian general. Commander at Marathon. Flourished 500 B. C.

Milton, John. English poet. *Paradise Lost.* Wrote many prose, political and controversial works. His sonnets are among the best in the language. His other works are *Comus, L'Allegro, Il Penseroso, Samson Agonistes, Paradise Regained, Lycidas.* Born, 1608; died, 1674.

Mirabeau, Gabriel H. de Riquetti, Count of. French orator and revolutionist. Entered army, 1767; imprisoned by his father at various times for intrigues and debts; president of National Convention, 1791. Born, 1749; died, 1791.

Mitchell, Donald G. ("Ik. Marvel.") American author. *My Farm at Edgewood; Reveries of a Bachelor.* Born, 1822.

Mithridates. "The Great." King of Pontus. With Tigranes of Armenia he fought the Romans for many years. Born, B. C. 130; died, 63.

Moltke, Hillmuth, Count von. German general. Conqueror in the Franco-Prussian war. Born, 1800; died, 1891.

Monroe, James. American President. Captain in Revolutionary War; studied law with Jefferson; delegate to Congress, 1783; opponent of Constitution; Senator, 1790; Minister to France, 1794–6; Governor of Virginia, 1799–1802; Envoy-Extraordinary to France, 1802; Minister to England, 1803; Governor of Virginia, 1811; Secretary of State, 1811–17; President, 1817–25. Born, 1758; died, 1831.

Montcalm, Louis J. de St. Véran, Marquis of. French commander in Canada. Killed on Abraham's Heights, in the battle with Wolfe. Born, 1712; died, 1759.

Montesquieu, Charles de Secondat, Baron de. French author. *Spirit of the Laws.* Born, 1689; died, 1755.

Montezuma II. Last Emperor of Mexico. Mortally wounded while attempting to quell insurrection of his subjects against Cortez. Born, 1470; died, 1520.

Moody, Dwight Lyman. Evangelist. Associated with Mr. Sankey; visited Great Britain in 1873 and 1883. Born, 1837; died, 1900.

Moore, Thomas. Irish poet. *Lalla Rookh, Irish Melodies, The Epicurean, Life of Sheridan, Life of Lord Byron.* Born 1779; died, 1852.

More, Sir Thomas. English statesman and author. Lord Chancellor; became favorite of Henry VIII.; published *Utopia,* 1516; speaker of House of Commons, 1523; Lord Chancellor, 1532; refused to acknowledge the validity of Henry's marriage to Anne Boleyn. Born, 1480; died, 1535.

Morris, Gouverneur. American Revolutionary statesman and orator. Minister to France; United States Senator; promoter of Erie Canal. Born, 1754; died, 1816.

Morris, Robert. American financier and statesman. Aided the Government with funds in the Revolution; Superintendent of Finances, 1781–4; imprisoned for debt. Born, 1734; died, 1800.

Morris, William. English poet and artistic designer of household decorations. *The Earthly Paradise, News from Nowhere,* etc. Born, 1834; died, 1896.

Morse, Samuel Finley Breese. American inventor of telegraph. Constructed small recording electric telegraph in 1835; constructed telegraph line from Washington to Baltimore, and brought telegraph into successful operation in 1846. Born, 1794; died, 1872.

Motley, John Lothrop. American historian and diplomatist. Minister to England and Aus ria. *The Rise of the Dutch Republic.* Born, 1814; Died, 1877.

Mozart, Johann. German composer. *The Marriage of Figaro, Don Giovanni, The Magic Flute.* His latest work, the *Requiem,* is his most sublime. Born, 1756; died, 1791.

Muller, F. Max. German philologist in England. *Chips from a German Workshop.* Born, 1833; died, 1900.

Murat, Joachim. French Marshal and King of Naples. Dashing cavalry leader. Born, 1770; died, 1815.

Murillo, Bartholomew Stephen. Spanish painter. His virgin saints and his beggar boys are famous. Among his great works are *St. Elizabeth of Hungary, The Prodigal Son, The Young Beggar, Moses Striking the Rock, St. Anthony of Padua,* and the *Marriage of St. Catherine.* Born, 1618; died, 1682.

Nansen, Fridtiof. Norwegian Arctic discoverer. Made his first journey across Greenland in 1888; set out in 1893 in the *Fram,* to drift to the pole; reached in 1895 86° 14′ north latitude, the highest then attained. Wintered in Franz Joseph Land; rescued in 1896. *The First Crossing of Greenland, Farthest North.* Born, 1861.

Nelson, Horatio, Viscount. English naval commander. Went to sea at thirteen; post captain, 1779; rear admiral, 1797; won battle of the Nile, 1798; second in command at Copenhagen, 1801, (but really won the fight); in 1805, with twenty-seven sail of the line and four frigates, defeated combined French and Spanish fleets at Trafalgar, where he was mortally wounded. Born, 1758; died, 1805.

Nero. Roman Emperor (54–68). Put his mother to death; persecuted Christians; said to have burned Rome. Born, 37; died, 68.

Newcomb, Simon. American astronomer. Conducted the American *Nautical Almanac.* Wrote much on astronomy. Born, 1835.

Newman, John Henry, Cardinal. English Catholic theologian. Born, 1801; died, 1840.

Newton, Sir Isaac. English mathematician and philosopher. His great work, the *Principia,* appeared in 1687. In this he shows that every particle of matter is attracted by every other particle with a force inversely proportional to the squares of the distances. Born, 1642; died, 1727.

Ney, Michael. "The Bravest of the Brave." One of Napoleon's marshals. Led Guard at Waterloo; shot by order of Louis XVII. Born, 1769; died, 1815.

Nicholas I. Czar of Russia. Warred with Turkey and Persia; put down Polish insurrection; engaged in Crimean War. Born, 1796; died, 1855.

Nicholas II. Czar of Russia. Son of Alexander III., and his successor in November, 1894. Married Princess Alice, granddaughter of Queen Victoria. Born, 1868.

Nightingale, Florence. English philanthropist. *Notes on Nursing.* Born, 1820.

Nobel, Alfred. Danish manufacturer. Discovered how to make dynamite. Left $10,000,000, most of it to go for annual prizes for important scientific discoveries, best literature, and best work in the cause of humanity. Born, 1833; died, 1896.

Nordenskjöld, Baron Nils Adolf Erik. Swedish explorer. In 1878–79 he made the first voyage from the Atlantic to the Pacific, north of Asia. *Voyage of the Vega.* Born, 1832.

Oates, Titus. English informer; inventor of the "Popish Plot." Born, 1620; died, 1705.

O'Connell, Daniel. Irish orator and agitator; advocate of Catholic Emancipation, and the repeal of the union. Born, 1775; died, 1847.

Oersted, Hans C. Danish scientist; founder of the science of electro-magnetism. Born, 1775; died, 1851.

Oglethorpe, James. British general; colonizer of Georgia. Born, 1688; died, 1785.

Ohm, George Simon. German physicist. Discovered the mathematical theory of the electric current, known as Ohm's Law. Born, 1787; died, 1854.

Oliphant, Margaret. Authoress. She wrote on history, biography, and criticism; *The Makers of Florence, of Venice, of Modern Rome; Lives of Dante, Cervantes, and Edward Irving.* Born, 1828; died, 1897.

Origen. Greek Father of the Church. *Hexapia.* Held universal restoration of the dead. Born, 185; died, 253.

Otis, Harrison Gray. American statesman and orator. A Federalist leader in Congress. Born, 1765; died, 1848.

Otis, James. American Revolutionary statesman and orator. Argued against writs of assistance; led popular party. Born, 1726; died, 1783.

Outram, Sir James. English general in India. Led expedition against Persia, 1836. Born, 1802; died, 1863.

Ovid, (Publius Ovidius Naso). Roman poet. *Metamorphoses.* Born, B.C. 43; died, A. D. 18.

Paderewski, Ignace Jan. Celebrated pianist. Born at Podolia, in Russian Poland; master of his art by incessant practice from early childhood; twice visited the United States; a brilliant composer as well as performer. Born, 1860.

Paganini, Niccolo. Italian violinist; celebrated for his performances on a single string. Born, 1784; died, 1840.

Paine, Robert Treat. American lawyer and statesman. Signed Declaration of Independence. Born 1731; died, 1814.

Paine, Thomas. American (English born) deist and political writer. *The Age of Reason, Common Sense.* Born, 1737; died, 1809.

Paley, William. English divine and theologian. *Evidences.* Born, 1743; died, 1805.

Palissy, Bernard. French potter. Discovered the art of enamelling stoneware. *Treatise on the Origin of Fountains.* Born, 1510; died, 1596.

Palmerston, Henry John Temple, 3d Viscount. English statesman; Minister of Foreign Affairs; long Prime Minister. Born, 1784; died, 1865.

Park, Mungo. Scotch traveler in Africa. *Travels in the Interior of Africa.* Born, 1771; died, 1805.

Parker, Theodore. American theologian and reformer. *Transient and Permanent in Christianity.* Born, 1810; died, 1860.

Parkman, Francis. American historian. *Conspiracy of Pontiac, A Half Century of Conflict,* etc. Born, 1823; died, 1893.

Parnell, Charles Stewart. Irish politician and agitator; M. P.; head of the Land League movement. Born, 1847; died, 1891.

Parr, Catherine. Last Queen of Henry VIII. of England, whom she succeeded in surviving. Born, 1509; died, 1548.

Parton, James. Noted American biographer. Married sister of N. P. Willis, who, as "Fannie Fern," wrote many children's books. Born, 1822; died, 1891.

Pascal, Blaise. Illustrious French thinker and writer. Was distinguished at once as a mathematician, a physicist, and a philosopher. Born, 1623; died, 1662.

Pasteur, Louis. French bacteriologist. He discovered the origin of fermentation, the silk-worm disease, splenic fever, etc., to be due to micro-organisms, and founded the germ theory of disease. Born, 1822; died, 1895.

Patrick, Saint. Apostle of Ireland. Born in Scotland. One of the first to preach Christianity in Ireland. Born, 372; died, 463.

Paul, Saint, of Tarsus. Apostle of the Gentiles. Born, —; died, 65.

Payne, John Howard. American dramatist and poet. *Home, Sweet Home.* Born, 1792; died, 1852.

Peabody, George. American banker in London; philanthropist. Founder of homes for workingmen in London, of museums, etc. Patron of education. Born, 1795; died, 1869.

Peary, Robert. American Arctic discoverer. He made three journeys to the far North; crossed northern Greenland in 1891 and 1894, and was in the polar regions in 1901. Born, 1856.

Peel, Sir Robert. English statesman and Prime Minister. Repealed the Corn Laws. Born, 1788; died, 1850.

Penn, William. Founder of Pennsylvania. The son of Admiral Penn, born in London; was converted to Quakerism while a student at Oxford. His father's death brought him a fortune and a claim upon the Crown, which he commuted for a grant of land in North America, where he founded

(1682) Pennsylvania. Here he established a refuge for all persecuted religionists, and, laying out Philadelphia as the capital, governed his colony wisely and generously for two years. He returned to England, where his friendship with James II. brought many advantages to the Quakers, but laid him under harassing and undeserved prosecutions for treason in the succeeding reign. The closing years of his life were clouded by mental decay. Born, 1644; died, 1718.

Pericles. Athenian orator and statesman. Came forward as a leader of the democracy 470 B. C. He secured the ostracism of Cimon, and after that event, and the ostracism of Thucydides, was the first man in Athens. He greatly increased the influence of Athens, which he adorned with noble public works. Born, B. C. —; died, 429.

Perry, Matthew C. American commodore. Chief of expedition to Japan. Born, 1795; died, 1858.

Perry, Oliver H. American naval commander. Won battle of Lake Erie. Born, 1785; died, 1820.

Pestalozzi, Giovanni H. Swiss educator. *Leinhard und Gertrude.* Born, 1746; died, 1827.

Peter the Hermit. Preacher of the First Crusade. Born, 1050; died, 1115.

Peter I. ("The Great.") Czar of Russia. Visited Western Europe in 1697; was for a time a shipcarpenter in Holland, and spent eight months in England; on his return to Russia, he reorganized the army and navy, founded schools, and took measures to increase Russian commerce; he made an alliance with Poland and Denmark, (1701) against Charles XII., whom he defeated at Pultowa (1709); founded St. Petersburg (1703). Born, 1672; died, 1725.

Petrarch, Francis. (Francesco Petrarca.) Italian poet and scholar. *Sonnets.* Born, 1304; died, 1374.

Phidias. Greatest of Greek sculptors. His masterpieces were the colossal ivory-and-gold statues (forty feet high) of Minerva at the Parthenon, and of Zeus at Olympia in Elis; the latter being counted one of the wonders of the world. Born, B. C. 490; died, 432.

Philip II. King of Macedonia. Father of Alexander the Great. Assassinated. Born, B. C. 382; died, 335.

Philip II. ("Augustus.") King of France. Annexed Normandy, Anjou, Lorraine; won battle of Bouvines. Born, 1165; died, 1223.

Philip IV. ("The Fair.") King of France. Suppressed the Templars; imprisoned Pope Boniface III. Born, 1268; died, 1314.

Philip II. King of Spain. Son of Charles V. Caused revolt in Netherlands; despatched Armada against England. Born, 1527; died, 1598.

Phillips, Wendell. American orator, Abolitionist. *Speech in Faneuil Hall,* 1836. Born, 1811; died, 1884.

Pierce, Franklin. American President. Born in New Hampshire; studied law; Democratic member Congress, 1832–37; U. S. Senator, 1837–42; brigadier-general in Mexican War; President, 1853–57; opposed coercion of seceding States. Born, 1804; died, 1869.

Pindar. Lyric poet of Thebes. *Odes.* Born, B. C. 518; died, 442.

Pisistratus. Tyrant of Athens. Patron of learning. Said to have had *Iliad and Odyssey* reduced to writing for the first time. Born, B. C. 612; died, 527.

Pitt, William. English statesman and orator; the second son of Lord Chatham. Entered Parliament in 1781; Chancellor of the Exchequer, 1782; First Lord of the Treasury, and Prime Minister, 1783; resigned in 1801, but took office again in 1804; was the head and front of the great coalition against Bonaparte. Born, 1759; died, 1806.

Pius IX. (Giovanni Maria Mastai Ferretti). Pope. Dogmas of Immaculate Conception and Papal Infallibility promulgated during his incumbency; temporal power lost 1870. Born, 1792; died, 1878.

Pizarro, Francis. Spanish conqueror of Peru. Born, 1475; died, 1541.

Plato. Greek philosopher and writer. Among his works are *The Republic, Phædo, Gorgias, Crito,* and *Apology for Socrates.* Born, B. C. 428; died, 347.

Pliny, The Elder. Roman savant and writer. *Natural History.* Born, 23; died, 79.

Pliny, The Younger. Roman writer and statesman. *Panegyric on Trajan.* Born, 61; died, 106.

Plutarch, Greek biographer. *Lives.* Born, 45; died, 120.

Poe, Edgar Allen. American poet. *The Raven.* Born, 1811; died, 1849.

Polk, James K. American President. Born in North Carolina; removed to Tennessee, 1806; studied law; member of Congress, 1825; elected speaker, 1835 and 1837; governor of Tennessee, 1839–41; Democratic President, 1845–49; prosecuted Mexican War. Born, 1795; died, 1849.

Polk, Leonidas, Bishop. American Confederate general and Episcopal prelate. Conspicuous at Shiloh and Stone River. Born, 1806; died, 1864.

Polo, Marco. Venetian traveler in the East. *The Book of Marco Polo.* Born, 1256; died, 1333.

Pompey (Cnæus Pompeius). Roman general and statesman. Conqueror of Spain and victor over Mithridates; leader of aristocracy; rival of Cæsar; defeated at Pharsalia. Born, B. C. 106; died, 48.

Ponce de Leon, Juan. Spanish discoverer of Florida. Born, 1460; died, 1521.

Pope, Alexander. English poet. *Pastorals, Essay on Criticism, Essay on Man,* etc. Born, 1688; died, 1744.

Porter, David. American naval officer. Commander of the *Essex.* Born, 1780; died, 1843.

Porter, David D. American naval officer. Admiral; bombarded Fort Fisher. *History of the Navy in the Rebellion.* Born, 1813; died, 1887.

Porter, Noah. American philosophical writer. President of Yale. *Human Intellect.* Born, 1811.

Prescott, William Hickling. American historian. *Ferdinand and Isabella,* etc. Born, 1796; died, 1859.

Ptolemy I. ("Soter.") King of Egypt. Founder of the dynasty of Greek sovereigns in Egypt; patron of literature. Born, B. C. 367; died, 282.

Ptolemy II. ("Philadelphus"). King of Egypt.

Founder of Alexandrian Library; Theocritus, Euclid, Aratus lived at his court. Born, B. C. 309; died, 247.

Ptolemy, Claudius. Greek mathematician and geographer. *Almagest.* Lived from about 100 to 160.

Pulaski, Count. Polish general in the American Revolution. Leader of "Pulaski's Legion;" killed at siege of Savannah. Born, 1747; died, 1779.

Putnam, Israel. General in the American Revolution. Conspicuous at Bunker Hill. Born, 1718; died, 1790.

Pyrrhus. King of Epirus. Defeated the Romans; conquered Macedonia; one of the greatest generals of antiquity. Born, B. C. 318; died, 272.

Pythagoras. Greek philosopher and writer. Taught doctrine of transmigration of souls. Born, B. C. 570; died, 510.

Quincy, Josiah. American statesman and author. Federalist member of Congress. *History of Harvard University.* Born, 1772; died, 1864.

Quincy, Josiah, Jr. American Revolutionary patriot and orator. *Observations on the Boston Port Bill.* Born, 1744; died, 1775.

Rabelais, Francois. French satirist and scholar. Joined Franciscans, but left the order. His great work is *The Pleasant Story of the Giant Gargantua and his Son Pantagruel.* Born, 1495; died, 1553.

Racine, Louis. French dramatist. Among his best works are the comedy *Les Pladeurs* (The Litigants), and the tragedies *Britannicus, Iphigenie, Phidre,* and *Athalie.* Born, 1639; died, 1699.

Raleigh, Sir Walter. English courtier, statesman, and author. *History of the World.* A favorite of Queen Elizabeth; executed by James I. Born, 1552; died, 1618.

Randolph, John, of Roanoke. American politician. Member of Congress; Minister to Russia; opposed Missouri Compromise; caustic wit. Born, 1773; died, 1833.

Raphael, (Raffaele Sanzio) of Urbino. Italian painter. *Sistine Madonna.* Among his other works are the frescoes called *The School of Athens, The Transfiguration, The Marriage of the Virgin, Galatea,* and the cartoons (designs for tapestry of the Pope's Chapel). Born, 1483; died, 1520.

Read, Thomas Buchanan. American poet and artist. *The Wagoner of the Alleghanies.* Born, 1822; died, 1872.

Reed, Thomas B. Distinguished American Congressman and Speaker of the House. A public speaker of note. Born, 1839.

Renan, J. Ernest. French Orientalist and author. *Life of Jesus.* Born, 1823; died, 1892.

Revere, Paul. American Revolutionary patriot. Carried to Concord news of impending attack of Gage. Born, 1735; died, 1818.

Reynolds, Sir Joshua. English painter. *Mrs. Siddons as the Tragic Muse.* Born, 1723; died, 1792.

Rhodes, Cecil John. English adventurer. He became chief owner of the South African diamond mines; Prime Minister of Cape Colony in 1890; and chief settler of "Rhodesia." Was accused of fomenting the war with the Transvaal; projected a railroad from Cape Town to Cairo. Born, 1853.

Richard I. (Cœur de Lion.) King of England. Conquered Acre; defeated Saladin. Born, 1157; died, 1199.

Richard III. King of England. Put Edward V. to death and usurped his crown; killed at Bosworth. Born, 1452; died, 1485.

Richardson, Samuel. English novelist. *Clarissa Harlowe, Sir Charles Grandison, Pamela.* Born, 1689; died, 1761.

Richelieu, Armand Jean Duplessis, Cardinal. French statesman. Made Cardinal, 1622; Prime Minister, 1624; secured exile of his foe, Marie de Medicis, 1630; reduced the Huguenots and captured Rochelle; supported German Protestants against Austria; founded French Academy (1635); added Alsace, Lorraine, and Roussillon to France. Born, 1585; died, 1642.

Richter, John Paul Frederich (Jean Paul). German novelist. *Thorn, Fruit, and Flower Pieces.* Born, 1763; died, 1825.

Rienzi, Nicolo Gabrini. Italian patriot and enthusiast. Tribune; for a short time ruler of Rome: "the friend of Petrarch, hope of Italy." Born, 1313; died, 1354.

Roberts, Lord Frederick. The hero of Kandahar (1880). Commander-in-chief of British forces in Boer War, South Africa, 1899–1900. Succeeded Lord Wolseley as commander-in-chief, and was made an earl. Born, 1832.

Robert I. (Bruce.) King of Scotland. Conquered Scotland from the English. Born, 1276; died, 1329.

Robespierre, Francois J. M. French Revolutionist. Leader of the extreme radicals; ruler during the Reign of Terror; guillotined. Born, 1759; died, 1794.

Rosebery, Archibald Philip Primrose, Earl of. English statesman; Prime Minister, 1894–1895. Born, 1847.

Roentgen, William Konrad von. German physicist. He discovered in 1895 the X-rays or Roentgen-rays. Born, 1845.

Rockefeller, John D. American capitalist; President Standard Oil Company. A man of immense wealth; gave largely to Chicago University. Born, 1840.

Roland, Madame Manon J. P. French Republican and writer. *Memoirs.* Guillotined. Born, 1754; died, 1793.

Roosevelt, Theodore. Vice-President of the United States with McKinley. Graduated Harvard, 1880; entered New York Legislature, 1882; appointed head of Civil Service Commission by President Harrison, 1889, and again by Cleveland, 1893; Commissioner of Police in New York, 1895; Assistant Secretary of Navy, 1897; Hero "Rough Riders" Spanish War, 1898; Governor of New York, 1899; elected Vice-President, 1900. Born, 1858. Succeeded to the Presidency, Sept. 14, 1901.

Rothschild, Meyer Amschel. Famous banker.

The founder of the Rothschild house, born at Frankfort-on-the-Main, a Jew by birth; began his career as a money lender and made a large fortune. Born, 1743; died, 1812.

Rubens, Peter Paul. Dutch painter. *Descent from the Cross, Last Judgment, Battle of the Amazons, Judgment of Paris, Rape of the Sabines.* Born, 1577; died, 1646.

Ruskin, John. English art critic. *Modern Painters.* Born, 1819; died, 1900.

Salisbury, Robert Arthur Talbot Gascoigne Cecil, Marquis of. English statesman. Entered the House of Lords as Lord Salisbury in 1867; became Secretary for Foreign Affairs in 1881, and, on the death of Beaconsfield, leader of the Conservative party; he was three times raised to the Premiership, the last time on Lord Rosebery's retirement in 1896. Born, 1830.

Sampson, William T. American Rear Admiral. Commanded United States fleets Atlantic squadron, during Spanish War. Born 1840. D. 1902.

Savonarola, Girolamo. Italian reformer. A Dominican monk and preacher; denounced the corruptions of the Church; deserted by his followers; put to death. Born, 1452; died, 1498.

Schiller, John C. F. von. German dramatist and poet. Studied law and medicine, but finally followed his own inclination to literature. *The Robbers, Thirty Years' War, Wallenstein, Mary Stuart, William Tell,* etc.

Schley, Winfield Scott. Rear Admiral American Navy. Rescued Greeley Expedition, 1884. Commanded in naval victory over Spanish fleet at Santiago, 1898. Born, 1839.

Schubert, Francis. German composer. His Songs (*Lieder*) and Ballads are his best work; musical, tender, and expressive in the rarest degree. Born, 1797; died, 1828.

Schurz, Carl. American journalist and politician. Secretary of the Interior, 1877–1881. Born, 1829.

Scott, Sir Walter. Scotch novelist, poet and historian. *Waverley* novels; *Marmion, Lay of the Last Minstrel, The Lady of the Lake, Rokeby, The Vision of Don Roderick.* Son of an Edinburgh writer to the signet; lived at Abbotsford; ruined by commercial speculation. Born, 1771; died, 1852.

Scott, Winfield. Eminent American general. Prominent service in the War of 1812 against the British; received gold medal from Congress, and was promoted to major-general; 1841, made commander-in-chief of the United States army; 1847, assumed command in Mexico; received surrender of the City of Mexico; defeated for presidency by Franklin Pierce; made lieutenant-general. Born, 1786; died, 1866.

Selkirk. Alexander. Scotch sailor. His adventures suggested *Robinson Crusoe.* Lived alone on Juan Fernandez, 1694–1709. Born, 1675; died, 1723.

Seward, William H. American Republican statesman. Secretary of State, 1861–69. Born, 1801; died, 1872.

Shafter, William Rufus. American General. Defeated Spanish General Torrel, and received surrender of Spanish army at Santiago, Cuba, 1898. Born, 1835.

Shakespeare, William. Greatest English poet and dramatist. *Lear, Hamlet, Macbeth, Othello, The Tempest, Midsummer Night's Dream;* born at Stratford-on-Avon; married Anne Hathaway, 1582; produced the poems *Venus and Adonis,* and the *Rape of Lucrece,* 1593–94, the only works published under his own hand; first collected edition of works appeared in 1623. Born, 1564: died, 1616.

Shelley, Percy Bysshe. English poet. *Cenci, Adonais, Prometheus, Revolt of Islam, Alastor, The Witch of Atlas;* was drowned off coast of Italy. Born, 1792; died, 1822.

Sheridan, Philip H. American general. Won battles of Winchester, Cedar Creek, Five Forks. Born, 1831; died, 1888.

Sherman, John. American politician and financier. Secretary of the Treasury, 1877–81; Secretary of State, 1897–98. Born, 1823; died, 1900.

Sherman, William Tecumseh. American general. Made the "March to the Sea," through Georgia. Born, 1820; died, 1891.

Sickles, Daniel Edgar. American general. Elected to Congress 1856; brigadier-general in Civil War, losing a leg at Gettysburg; Minister to Spain, 1869–73. In Congress, 1892–94. Born, 1822; died, 1901.

Simon, Jules. French statesman and author of numerous works. Born, 1841; died, 1896.

Smiles, Samuel, LL. D. Scotch editor and author. Among his books are *Self-Help, Character, Thrift, Life and Labor,* and the *Biographies of Inventors.* Born, 1816.

Smith, Adam. Scotch political economist. *Wealth of Nations.* Born, 1723; died, 1790.

Smith, Joseph. Founder of the Mormon Church. Claimed to dictate the *Book of Mormon* from gold plates found in New York State; arrested and imprisoned in the jail at Carthage, Mo., where he was killed by a mob. Born, 1805; died, 1844.

Smith, John, Captain. English adventurer. Famous Governor of Colony of Virginia. *History of Virginia.* Born, 1579; died, 1631.

Smith, Sydney, Rev. English divine and wit. Projector of the *Edinburgh Review, Peter Plymley's Letters.* Born, 1771; died, 1845.

Socrates. Athenian philosopher. Teacher of Plato. Put to death for his radical opinions. Born, B. C. 468; died, 399.

Southey, Robert, English poet laureate. *Curse of Kehama, Madoc, Thalaba, Don Roderick.* Born, 1774; died, 1843.

Spencer, Herbert. English philosopher. *System of Evolutionary Philosophy.* Born, 1820.

Spinoza, Benedict. Dutch philosopher. *Ethics Demonstrated by a Geometric Method.* Born, 1632; died, 1677.

Stael, Anna M. L. G., Baroness de. French authoress. Opposed Napoleon and was banished. *Corinne.* Born, 1766; died, 1817.

Standish, Miles, Captain. Plymouth colonist and soldier. Born, 1584; died, 1656.

Stanley, Henry Morton. African explorer. Born in Wales; went as a boy to America; became a

newspaper correspondent; in 1869 was sent by the New York *Herald* to Africa to "find Livingstone;" succeeded in 1871. Wrote *The Congo, In Darkest Africa*, etc. Born, 1841.

Stanton, Edwin McMasters. American statesman. Attorney-General of the United States under Buchanan; Secretary of War under Presidents Lincoln and Johnson. Became a Justice of the Supreme Court of the United States, 1869. Born, 1815; died, 1869.

Stanton, Elizabeth Cady. One of the first agitators of woman's rights in the United States, and a leading advocate, lecturer, and writer on this subject and other reforms. Born, 1816.

Stedman, Edmund Clarence. American poet, and banker. Aside from his original compositions, edited *Victorian Poets, American Poets, Library of American Literature.* Born, 1833.

Stephens, Alexander H. American statesman. Vice-President of the Southern Confederacy. Born, 1812; died, 1883.

Stephenson, George. English inventor of the locomotive. In 1814 constructed a locomotive which drew eight cars; invented the steam blast pipe, and greatly improved the construction of the railroad; finally built an engine running thirty-five miles an hour. Born, 1781; died, 1848.

Stephenson, Robert. English inventor of the tubular bridge. Born, 1803; died, 1859.

Sterne, Laurence. English writer. *Tristram Shandy, Sentimental Journey.* Born, 1713; died, 1768.

Stevenson, Robert Louis Balfour. English novelist. *Treasure Island* (1883) won him fame; died in the Samoan Islands, where he made his home. Born, 1850; died, 1894.

Stevenson, Adlai Ewing. American statesman. Vice-President of the United States, 1893–97, with Grover Cleveland. Nominated again in 1900, with William Jennings Bryan, but failed of election. Born, 1835.

Stewart, Alexander T. American millionaire merchant. Born, 1803; died, 1876.

Stockton, Francis Richard. American novelist, and writer of humorous and fantastic tales. *Rudder Grange* and *The Lady or the Tiger?* Born, 1834.

Story, Joseph. American jurist. Justice of the Supreme Court. *Commentaries on the Constitution.* Born, 1779; died, 1845.

Stowe, Harriet E. Beecher. *Uncle Tom's Cabin.* Born, 1812; died, 1896.

Strauss, David Friedrich. German rationalist. Originator of the mythical theory of the Scriptures; Professor of Divinity at Zurich. Author of *The Life of Jesus,* which caused a great sensation by its skepticism. Born, 1808; died, 1874.

Stuart, Gilbert C. American portrait painter. *Portrait of George Washington.* Born, 1756; died, 1828.

Sullivan, Sir Arthur. Noted English musical composer. Author of *Pinafore Pirates of Penzance,* and *Patience.* Born, 1844; died, 1900.

Sumner, Charles. American Republican statesman, orator, and Senator. *The Grandeur of Nations.* Born, 1811; died, 1874.

Swedenborg, Emanuel. Swedish religionist and naturalist. The central point of his theosophy is the correspondence of the natural and the supernatural. Born, 1689; died, 1772.

Swift, Jonathan Irish divine and satirist. Entered Church; became Dean of St. Patrick's; *Tale of a Tub, Gulliver's Travels.* Born, 1667; died, 1745.

Talleyrand Perigord, Charles Maurice, Prince of. French diplomatist and wit. Minister of Foreign Affairs. Born, 1754; died, 1836.

Taney, Roger B. American jurist and Democratic statesman. Chief Justice of the United States. Born, 1777; died, 1864.

Taylor, Bayard. American traveler, novelist, poet. Translator of Goethe's *Faust; Prince Deucalion; Masque of the Gods; John Godfrey's Fortunes.* Born, 1825; died, 1878.

Taylor, Zachary. American President. Entered army in 1808; major-general in Mexican War; won battle of Buena Vista; elected President by the Whigs in 1848. Born, 1784; died, 1850.

Temple, Sir William. English statesman and author. Negotiated the Triple Alliance of 1668. Born, 1628; died, 1699.

Tennyson, Alfred. English poet. Educated at Cambridge; made poet-laureate in 1850. *In Memoriam, Enoch Arden, The Princess, Maud, The Idylls of the King, Queen Mary, Harold.* Born, 1809; died, 1893.

Tesla, Nikola. American electrician of Servian birth. He made remarkable experiments with currents of high frequency, and invented useful electrical devices. Born, 1857.

Thackeray, William Makepeace. English novelist; born in Calcutta. *Henry Esmond, Vanity Fair, The Newcomes, Pendennis, The Four Georges, English Humorists.* Born, 1811; died, 1863.

Thiers, Louis Adolphe. First President of the French Republic (1871–73.) *History of the Consulate and Empire.* Born, 1797; died, 1877.

Thomas, George H. American Federal general. Saved army at Chickamauga; won battle of Nashville. Born, 1816; died, 1870.

Thompson, Sir John S. O. Canadian jurist. Attorney-General and Minister of Justice (1885); Premier of Canada (1893). Born, 1844; died, 1894.

Thomson, James. Scotch poet. *The Seasons, The Castle of Indolence, Tancred and Sigismunda.* Born, 1700; died, 1748.

Thoreau, Henry D. American author. *The Concord and Merrimac Rivers, The Maine Woods.* Born, 1817; died, 1862.

Thorwaldsen, Albert D. Danish sculptor. *Triumphal March of Alexander,* Statues of *Christ and His Apostles.* Born, 1770; died, 1844.

Tindale, William. English reformer and martyr. Translated the New Testament into English. Was strangled and burned at the stake for heresy. Born, 1480; died, 1536.

Tilden, Samuel J. American Democratic statesman. Candidate for President in 1876. Born 1814; died, 1885.

Titian. (Tiziano Vecelli) Italian painter. Among his masterpieces are the *Assumption of the Virgin, Presentation of the Virgin, The Last Supper.* Born, 1477; died, 1566.

Tocqueville, Alexis C. H. C. de. French author. *American Democracy.* Born, 1805; died, 1859.

Tolstoi, Count Leo. Russian writer and social reformer. Famous as a poet and novelist; devoted himself to remedy the ills of poverty; living and toiling like a peasant. In 1901 he was banished from Russia on account of his radical teachings. *War and Peace, Anna Karenina, The Kreutzer Sonata,* etc. Born, 1828.

Toombs, Robert. American statesman. United States Senate, 1853–59; leader of Georgia secessionists. Born, 1810; died, 1885.

Torricelli, Evangelista. Italian physicist. Inventor of the barometer. Born, 1608; died, 1647.

Toussaint l'Ouverture, Francois. Negro chief of the Haytien Rebellion. Born, 1743; died, 1803.

Trollope, Anthony. English novelist. *Barchester Towers.* Born, 1815; died, 1882.

Trowbridge, John Townsend. American author, poet, and juvenile writer. *Coupon Bonds* and *The Vagabonds* are his best known productions. Born, 1827.

Tupper, Sir Charles. A Canadian statesman. Served in several ministerial offices, and as Lord High Commissioner in London; Premier (1896). Born, 1821.

Turner, Joseph M. W. English painter. *The Slave Ship.* Born, 1775; died, 1851.

Tweed, William Marcy. Famous Tammany "boss" in New York City. Convicted of fraud and imprisoned; escaped to Spain, but was sent back, and died in prison. Born, 1823; died, 1878.

Tyler, John. American President. Born in Virginia; practiced law; M. C. 1816–21; Governor of Virginia 1825; elected U. S. Senator 1827; resigned 1836; elected Vice-President on Whig ticket 1840; succeeded Harrison on his death in 1841. Born, 1790; died, 1862.

Tyndall, John. English physicist. *Heat Considered as a Mode of Motion.* Born, 1820; died, 1893. Attorney-General of New York 1815; leading man of the "Albany Regency;"

Van Buren, Martin. American President. Entered bar 1803; elected U. S. Senator by the Democrats 1821; Governor of New York 1828; Secretary of State 1829–31; Vice-President 1833–37; President 1837–41. Born, 1782; died, 1862.

Vandyke, Sir Anthony. Flemish painter in England. Pupil of Rubens; settled in England in 1632, among his best works are *The Erection of the Cross, Portrait of the Earl of Strafford,* and a *Crucifixion.* Born, 1599; died, 1641.

Van Rensselaer, Stephen. American statesman and landholder. *The Patroon.* Founder of the Rensselaer Institute. Born, 1764; died, 1839.

Vancouver, George. English navigator. Discoverer of Vancouver's Island. Born, 1758; died, died 1798.

Vanderbilt, Cornelius. American capitalist. Founder of the Vanderbilt family and fortune. Born, 1794; died, 1877.

Vane, Sir Henry English painter. Statesman; leader of independents; head of navy; beheaded. Born, 1612; died, 1662.

Verdi, Guiseppe. Italian musical composer and Senator. Among his productions are *Ernani, La Traviata, Il Trovatore, Montezuma,* and *Aida.* Born, 1814; died, 1901.

Vespucius, Americus. Italian navigator. America was named after him. Born, 1451; died, 1512.

Victor, Emmanuel II. King of Sardinia; first King of Italy; restorer of Italian unity. Born, 1820; died, 1878.

Victor, Emmanuel III. King of Italy. Succeeded to the throne in 1900, on the assassination of his father, Humbert I. Born, 1869.

Voltaire, Francois M. Arouet de. French philosopher, poet, historian, wit, skeptic. Passed the years 1750–53 with Frederick the Great; took up his residence (1755) at Ferney; *The Age of Louis XIV., Essay on the Manners of Nations,* and *Candide.* Born, 1694; died, 1778.

Wade, Benjamin F. American politician. Republican Senator from Ohio; Abolitionist. Born, 1800; died, 1878.

Wagner, Richard. German composer. *Lohengrin, Gotterdammerung, Tannhauser, Rheingold, Nibelungenlied;* produced *Parsifal* at Bayreuth, 1882. Born, 1813; died, 1883.

Wainwright, Richard. U. S. naval officer. Executive officer of the battleship *Maine,* blown up in Havana harbor; commander of the *Gloucester,* battle of Santiago, 1898. Born, 1849.

Wales, Albert Edward. Eldest son of Queen Victoria. Became King of England on the death of his mother, January, 1901, under the title of Edward VII. Born, 1841.

Wallace, Lewis. An American soldier and novelist. General in the Civil War; wrote *Ben Hur, The Prince of India,* etc. Born, 1827.

Wallace, Sir William. Scotch patriot and general. Fought Edward I. of England; executed. Born, 1270; died, 1305.

Wallenstein, Albert, Count of, German general. Opponent of Gustavus Adolphus, by whom he was defeated, 1632; in 1634 he was deprived of his command and assassinated. Born, 1583; died, 1634.

Walton, Izaak. English writer. *The Complete Angler.* Born, 1593; died, 1683.

Wanamaker, John. An American merchant. Originator of the department store idea; Postmaster-General 1889–93. Born, 1838.

Ward, Mrs. Humphrey. English novelist. Granddaughter of Dr. Arnold, of Rugby. *Robert Elsmere, Marcella,* etc. Born, 1851.

Warner, Charles Dudley. American humorist and essayist. *Summer in a Garden, Back-log Studies, Washington Irving* (1881), *Captain John Smith, In the Levant.* Born, 1828; died, 1900.

Washington, George. Commander-in-chief in the American Revolution. First President of the United States; aide-de-camp to Braddock in the Indian campaign of 1755; married Martha Custis, 1759; chosen to Congress, 1774; appointed Commander-in-chief, 1775; President, 1789–97. Born, 1732; died, 1799.

Watt, James. Scotch inventor. Principal inventor of the steam engine; used the expansive force of

steam to depress a piston; improved engines for pumping water. Born, 1736; died, 1819.

Webster, Daniel. American lawyer, orator, and statesman. Greatest legal effort was the Dartmouth College case; greatest Congressional speech was his reply to Hayne. Born, 1782; died, 1852.

Webster, Noah. American lexicographer. *Dictionary of the English Language.* Born, 1758; died, 1843.

Wedgewood, Josiah. English potter. Originator and maker of the famous "Wedgewood" ware. Born, 1730; died, 1795.

Wellington, Arthur Wellesley. Duke of. British general and statesman. General in India; was made commander-in-chief in Spain and Portugal; fought the battles of Talavera, Sabagal, and Albuera; captured Badajos, 1812; won at Waterloo, 1815; was afterward Prime Minister and Minister of Foreign Affairs. Born, 1769; died, 1852.

Wesley, Charles, Rev. English poet and divine. *Hymns.* Born, 1708; died, 1788.

Wesley, John. Founder of the Methodist Wesleyans. Born, 1703; died, 1791.

West, Benjamin. American painter in England. *The Death of Wolfe, Death on the Pale Horse.* Born, 1738; died, 1820.

Westinghouse, George. American inventor. Famous for inventing the Westinghouse airbrake. Born, 1846.

Wheeler, Joseph. American soldier. Graduated at West Point in 1859; entered Confederate service in Civil War; entered Congress, 1881; took part in the Santiago campaign in Cuba in 1898; served in the Philippines in 1899; appointed brigadier-general in U. S. army. Born, 1836.

Whitefield, George, Rev. English Methodist preacher and revivalist. Born, 1714; died, 1770.

Whitney, Eli. American inventor. The cotton-gin. Born, 1765; died, 1825.

Whittier, John Greenleaf. American poet, farmer, shoemaker, journalist, anti-slavery agitator. *Snow-Bound, Voices of Freedom, Home Ballads, In War Time, The Tent on the Beach.* Born, 1808; died, 1893.

Whitman, Walt. American poet. Editor, carpenter, nurse, government clerk. *Leaves of Grass, The Two Rivulets, Drum Taps, Democratic Vistas.* Born, 1819; died, 1892.

Wilberforce, William. English philanthropist, statesman, and reformer. Secured abolition of slave trade. Born, 1759; died, 1833.

Willard, Frances Elizabeth. American temperance reformer and lecturer. Founder of the World's W. T. C. U., and its first president; author of several reformatory works. Born, 1839; died, 1898.

William I. Seventh King of Prussia, and first German Emperor. He succeeded to the throne in 1861, and was crowned Emporer in 1871, on the formation of the German Empire after the Franco-Prussian War. Born, 1797; died, 1888.

William II. Emperor of Germany. Son of Frederick, the second Emperor, whom he succeeded in 1888. Born, 1859.

Williams, Roger. Founder of Rhode Island Colony. Born, 1606; died, 1683.

Winthrop, John. Governor and founder of the Massachusetts Bay Colony. Born, 1588; died, 1649.

Wolsey, Thomas, Cardinal. English statesman. Chancellor of Henry VIII.; secured Henry's divorce from Catherine. Born, 1471; died, 1530.

Worcester, J. E. American lexicographer. *Dictionary.* Born, 1734; died, 1866.

Wordsworth, William. English poet. Educated at Cambridge; with Coleridge produced *Lyrical Ballads,* 1798; settled at Rydal Mount, 1803; published *Poems,* 1807; *The Excursion,* 1814. Among his other works are *Ecclesiastical Sonnets, The Wagoner, Yarrow Revisited, The Prelude.* Born, 1770; died, 1850.

Wren, Sir Christopher. English architect. St. Paul's Cathedral. Born, 1632; died, 1723.

Wycliffe, John. English reformer. Translator of the Scriptures. Born, 1324; died, 1384.

Xavier, Francis, Saint. "Apostle of the Indies." Jesuit missionary to India and Japan. Born, 1506; died, 1552.

Xerxes I. King of Persia. Invader of Greece; beaten at Salamis. Born, B. C. —; died, 465.

Yale, Elihu. Founder of Yale College. Born, 1648; died, 1721.

Yonge, Charlotte. A well-known author, writer of novels, and children's books and histories. *The Heir of Redclyffe, Cameos of History of England.* Born, 1823; died, 1901.

Young, Brigham. American religionist. Head of the Mormons. Born, 1801; died, 1877.

Young, Edward. English poet. Rector of Welwyn, in Hertfordshire. *Night Thoughts, The Revenge, The Love of Fame.* Born, 1684; died, 1756.

Zenobia, Septimia. Queen of Palmyra (266–73.) Her dominions extended from the Mediterranean to the Euphrates, and included a large part of Asia Minor. She refused allegiance to Aurelian, who defeated her and captured Palmyra; passed the rest of her life at Tibur, in Italy. Born, —; died, 275.

Zeuxis. Greek painter. *The Infant Hercules Strangling a Serpent.* Flourished B. C. 5th century.

Zinzendorf, Nicholas Louis, Count of. Founder of the Moravians. *The Journey of Atticus Through the World.* Born, 1700; died, 1760.

Ziska, John. Hussite chief. Beat Imperial armies thirteen times. Born, 1360; died, 1424.

Zola, Emile. French novelist. Wrote *Contes a Ninon* and other collections of short stories, and a large number of realistic novels. Among the latest are *Lourdes, Rome,* and *Paris* Born, 1840.

Zoroaster. A Persian philosopher. Distinguished as the founder of the Magian religion. 1500 to 200 B. C.

Zwingli, Ulric. Swiss reformer. *Exposition of the Christian Faith.* Killed in battle. Born 1484; died, 1531.

Zwirner, Ernst Friedrich. German architect Completed Cathedral of Cologne; built many castles on the Rhine, famed for their beauty. Born, 1802; died, 1861.

Part II.

ANECDOTES AND INCIDENTS

THROWING LIGHT ON THE VIEWS AND CHARACTERS OF GREAT HISTORIC PERSONAGES.

The Puritans and Roger Williams.

Roger Williams, the founder of Rhode Island, was banished from the Colony of Massachusetts in 1634—driven in the dead of winter into the dense and desolate forests, by the Puritans, for contending for freedom of conscience in religious matters, and for other and similar heretical notions. "It is strange," says Ridpath, "that the very men who had so recently, through perils by sea and land, escaped with only their lives, to find religious freedom in another continent, should have begun their career with intolerance and proscription."

Imprisonment of La Tude.

La Tude, a young Frenchman, for a trifling offence, was seized and thrown into prison by order of the cruel and vindictive woman, the Madame de Pompadour. There he remained until her death, in 1764. Two years before (1762) he wrote the heartless woman as follows: "I have suffered fourteen years; let all be buried forever in the blood of Jesus." She remained inflexible. This young Frenchman remained almost continuously in prison for thirty-five years. The story of his prison life, and his various attempts at escape, form one of the most thrilling chapters in French history.

Carlyle and His Burned Book.

When Thomas Carlyle, was writing his famous history of the French Revolution, and when he had the first volume ready for the printer's hands, he one day loaned the manuscript to John Stuart Mill, his intimate and admiring friend. This friend's servant girl, seeing the pile on the library floor one day, and wanting some kindling, unceremoniously crammed the whole of it into the stove, and set fire to it. Thus the priceless labor of many years was in a few moments swept away. When Carlyle heard of it, from the mouth of Mill himself, his spirit fairly broke down under the terrible disaster. But his tears washed out his weakness, and with a brave heart he set to work to repair the almost irreparable loss. He relates of himself that, when he first began the re-writing, and feeling still the terrible blow he had received, he was one day seated by the window, watching some masons at work on a building opposite. He noticed how, by simply putting one brick upon another, the huge structure finally rose. The thought gave him fresh courage, and so he pressed on, putting one line upon another, until the work was completed. And hence we have to-day the second creation of that important work, the French Revolution, really better than the first.

More About the Burned Book.

Carlyle gives us, in his own language, an account of what followed when Mill himself came to tell them of the great loss of the destruction of the manuscript:

"How well do I still remember that night when he came to tell us, pale as Hector's ghost, that my unfortunate first volume was burnt. It was like half-sentence of death to us both, and we had to pretend to take it lightly, so dismal and ghastly was his horror, and try to talk of other matters. He stayed three mortal hours or so; his departure was quite a relief to us. Oh, the burst of sympathy my poor darling then gave me, flinging her arms round my neck, and openly lamenting, condoling, and encouraging, like a nobler, better self! Under

heaven is nothing beautifuller. We sat talking till late. 'Shall be written again,' my fixed word and resolution to her. Which proved to be such a task as I never tried before or since. I wrote out 'Feast of Pikes,' and then went at it. Found it fairly impossible for about a fortnight; passed three weeks reading Marryat's novels, tried cautiously, as on ice, paper-thin, once more; and, in short, had a job more like breaking my heart than any other in my experience. . . . Mill was penitently liberal; sent me £200 in a day or two, of which I kept £100, actual cost of house while I had written burnt volume; upon which he bought me 'Biographie Universelle,' which I got bound, and still have. Wish I could find a way of getting the now much macerated, changed and fanaticised 'John Stuart Mill' to take the £100 back; but I fear there is no way."

Last Moments of Mozart.

A few months before the death of the celebrated Mozart, a mysterious stranger brought him an anonymous letter, in which his terms for a requiem were required. Mozart gave them. Soon after the messenger returned, and paid a portion of the price in advance. To the composition of this requiem he gave the full strength of his powers. Failing to learn the name of him who had ordered it, his fancy soon began to connect something supernatural with the affair. The conviction seized him that he was composing a requiem for his own obsequies. While engaged in this work, and under this strange inspiration, he threw himself back, says his biographer, on his couch, faint and exhausted. His countenance was pale and emaciated; yet there was a strange fire in his eye, and the light of gratified joy on his brow that told of success.

His task was finished, and the melody, even to his exquisite sensibility, was perfect. It had occupied him for weeks; it bore an unearthly sweetness that was to him too truly a warning of his future and fast-coming doom.

Now it was finished, and, for the first time for many weeks, he sank into a quiet and refreshing slumber. A slight noise in the apartment awoke him, when, turning toward a fair young girl who entered—"Emilie, my daughter," said he, "come near to me—my task is over—the requiem is finished. My requiem," he added, and a sigh escaped him.

"Oh! say not so, my father," said the girl, interrupting him, as tears stood in her eyes, "you must be better, you look better, for even now your cheek has a glow upon it; do let me bring you something refreshing, and I am sure we will nurse you well again."

"Do not deceive yourself, my love," said he; "this wasted form can never be restored by human aid. From Heaven's mercy alone can I hope for succor; and it will be granted, Emilie, in the time of my utmost need; yes, in the hour of death, I will claim His help who is always ready to aid those who trust in Him; and soon, very soon, must this mortal frame be laid in its quiet sleeping-place, and this restless soul return to Him who gave it."

The dying father then raised himself on his couch;—"you spoke of refreshment, my daughter; it can still be afforded my fainting *soul*. Take these notes, the last I shall ever pen, and sit down to the instrument. Sing with them the hymn so beloved by your mother, and let me once more hear those tones which have been my delight since my earliest remembrance."

Emilie did as she was desired: she commenced, in the sweetest voice, the following lines:

Spirit! thy labor is o'er,
Thy term of probation is run.
Thy steps are now bound for the untrodden shore,
And the race of immortals begun.

* * * * * *

* * * * * *

Spirit! how bright is the road,
For which thou art now on the wing!
Thy home it will be with thy Saviour and God,
Their loud hallelujahs to sing!

As she concluded the last stanza, she dwelt for a few moments on the low, melancholy notes of the piece, and then waited in silence for the mild voice of her father's praise. He spoke not: he was *gone*. With the sound of the sweetest melody ever composed by human thought, his soul had winged its flight to regions of eternal bliss.

Disraeli Says a Man Can Be What He Pleases.

The late Lord Beaconsfield, in an address before the Literary and Scientific Institution of London, in 1844, his early life, gave utterance to these impressive words:

"Man *can be* what he pleases; every one of you can be exactly what he designs to be. I have resolved to hold a certain position, and, if I live, *I will*."

We do not know what the position was that Disraeli here refers to, but we do know that he attained to the highest position possible to any man in England. He had much to contend with; he was a Jew; but, by the mere power of his will, he ejected the Jew blood from his veins, and pumped the blue blood of England in! and then, with a daring and sublime effrontery, he climbed into the seat next to the great white throne of the Queen herself.

A Brilliant Reception to Seward.

It is well known that the late William H. Seward, in his journey around the world, was the recipient of many distinguished honors. Miss Olive Risley Seward, his daughter, and a member of his company, gives the following account of their reception at Putteeala, in British India:

The presentations being over, a multitude of servants, "that no man in haste could number," came, bearing silver trays on their heads, filled with India fabrics of muslins, cambrics, cashmeres, silks, and jewels, and laid the whole at Mr. Seward's feet, the trays covering twenty feet square on the floor. The Prince, with infinite gravity, invited Mr. Seward to accept this "small and unworthy collection," as a token of His Highness' respect and affection. Mr. Seward, having been previously instructed, touched with his finger the simplest article, a turban scarf of purple interwoven with gold thread. The trays and their bearers immediately disappeared, but only to be replaced by a similar display, no less costly and elegant. These treasures were laid at the feet of one of the ladies, who was asked to accept this "poor trash." In accordance with an intimation through an officer, she touched a cashmere shawl. The train and merchandise disappeared, and the third and equal presentation was made to the second lady, who in like manner touched a shawl. The Prince, who had looked on with an air of supreme indifference to the whole proceeding, then said to Mr. Seward, "I have a great many other things in the palace, which I should like to present to you, but I will not take up your time to look at them." Then, thanking Mr. Seward and the ladies for having accepted these "unworthy trifles," he, in a loud voice, and in an imperious manner, directed that all the articles which had been thus displayed and offered to us, should be conveyed to Mr. Seward's palace, and delivered to his servants. For our part, we are quite sure that "these unworthy trifles" would have been sufficient to stock an Indian bazar in New York.

Instances of Absence of Mind in which Some Great Men Figure.

Every one has heard the old story of the silent man, who, riding over a bridge, asked his servant if he liked eggs, to which the servant answered, "Yes." Nothing more passed till the next year, when, riding over the same bridge, he turned to his servant and said, "How?" Poached, sir," was the immediate answer.

Sidney Smith cites two instances of absence of mind which struck his fancy: "I heard of a clergyman who went jogging along the road till he came to a turnpike: "What's to pay?" "Pay, sir, for what?" asked the turnpike man. "Why, for my horse, to be sure." "Your horse, sir? What horse? There is no horse, sir!" "No horse? God bless me," said he, suddenly looking between his legs, "I thought I was on horseback."

Lord Dudley was one of the most absent-minded men I think I ever met in society. One day he met me in the street and invited me to meet myself. "Dine with me today," said he, "and I will get Sidney Smith to meet you." I admitted the temptation he held out to me, but said I was engaged to meet him elsewhere.

Disraeli says, it has been told of a modern astronomer, that one summer night when he

was withdrawing to his chamber, the brightness of the heavens showed a phenomenon. He passed the whole night in observing it, and when they came to him early in the morning, and found him in the same attitude, he said, like one who had been collecting his thoughts for a few moments: "It must be thus; but I will go to bed before it is too late." He had gazed the entire night in meditation, and was not aware of it.

The Count de Brancas was one day reading in his study when a nurse brought in a little infant; he put down his book, took up the infant, and caressed it admiringly. A friend came in, and Brancas threw the baby down on the table, thinking it was a book. A loud crying announced his mistake.—*Selected*.

Douglas Held Lincoln's Hat.

When Mr. Lincoln delivered his first inaugural he was introduced by his friend, United States Senator E. D. Baker, of Oregon. He carried a cane and a little roll—the manuscript of his inaugural address. There was a moment's pause after the introduction, as he vainly looked for a spot where he might place his high silk hat.

Stephen A. Douglas, the political antagonist of his whole public life, the man who had pressed him hardest in the campaign of 1860, was seated just behind him. Douglas stepped forward quickly, and took the hat which Mr. Lincoln held helplessly in his hand.

"If I can't be President," Douglas whispered smilingly to Mrs. Brown, a cousin of Mrs. Lincoln, and a member of the President's party, "I at least can hold his hat."

Lincoln as a Humorist and Story-teller.

No great statesman of history, perhaps, figures before the world so prominently as a story-teller and humorist as our great but sad-faced War President, Abraham Lincoln. In the most serious of situations, sometimes of grave national importance, the President, with lines of pain deep marked in his countenance, often interrupted the proceedings of his Cabinet to tell a laughter-provoking story. Once when asked by an impatient statesman why he did it, he suddenly ceased laughing, and in a voice well-nigh pathetic said, "To relieve the strain. There are times when my heart would break if I should not lift the burden for a moment, and there is nothing that does it so well as a diverting story."

Lincoln's Peace Story.

President Lincoln was at all times an advocate of peace, provided it could be obtained honorably and with credit to the United States. As to the cause of the Civil War, which side of Mason and Dixon's line was responsible for it, who fired the first shots, who were the aggressors, etc., Lincoln did not seem to bother about; he wanted to preserve the Union, above all things. Slavery, he was assured, was dead, but he thought the former slaveholders should be recompensed.

To illustrate his feelings in the matter he told this story:

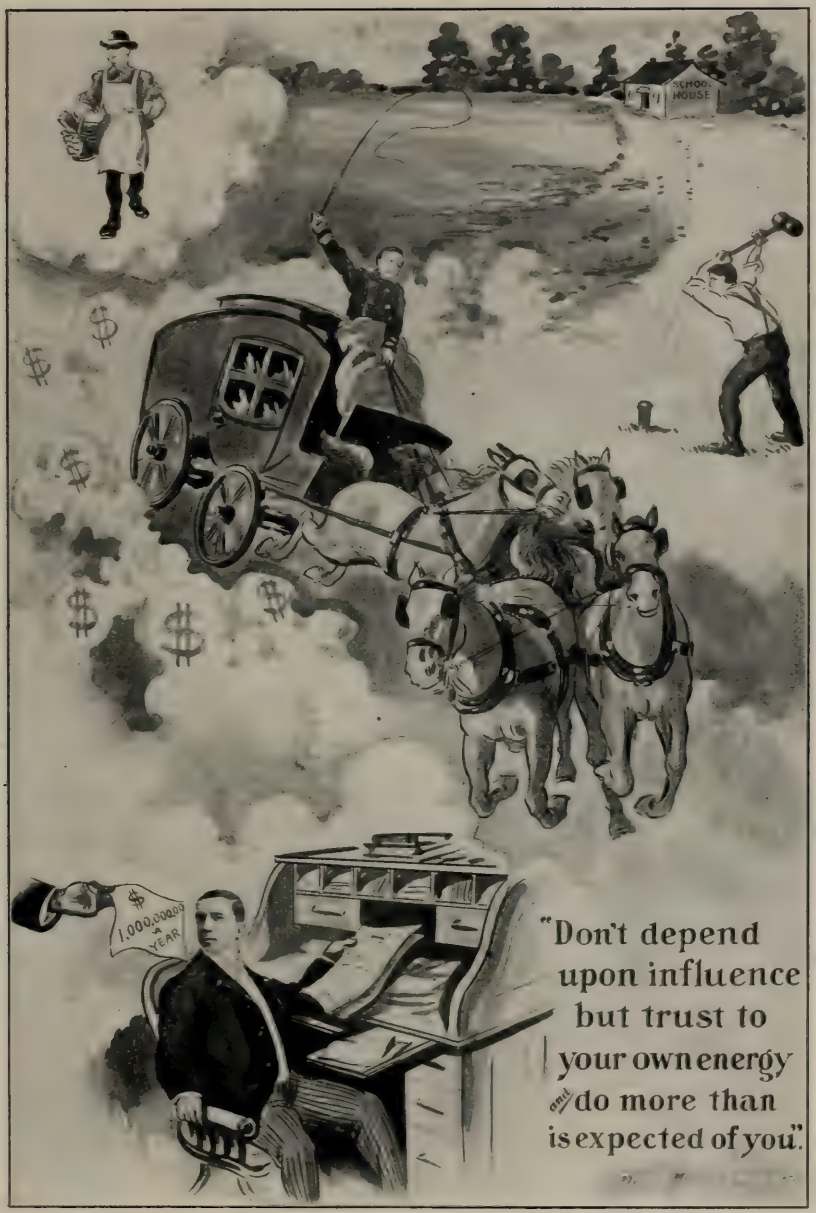
"Some of the supporters of the Union cause are opposed to accommodate or yield to the South in any manner or way because the Confederates began the war; were determined to take their States out of the Union, and, consequently, should be held responsible to the last stage for whatever may come in the future. Now this reminds me of a good story I heard once, when I lived in Illinois.

"A vicious bull in a pasture took after everybody who tried to cross the lot, and one day a neighbor of the owner was the victim. This man was a speedy fellow and got to a friendly tree ahead of the bull, but not in time to climb the tree. So he led the enraged animal a merry race around the tree, finally succeeding in seizing it by the tail.

"The bull, being at a disadvantage, not able to either catch the man or release his tail, was mad enough to eat nails; he dug up the earth with his feet, scattered gravel all around, bellowed until you could hear him for two miles or more, and at length broke into a dead run, the man hanging on to his tail all the time.

"While the bull, much out of temper, was legging it to the best of his ability, his tormentor, still clinging to the tail, asked, 'Darn you, who commenced this fuss?'

"It's our duty to settle this fuss at the earliest possible moment, no matter who commenced it. That's my idea of it."



FROM STAGE DRIVER TO PRESIDENT OF COMPANY

Charles M. Schwab before he was forty years of age was at the head of one of the greatest industries, involving largest capital and employing the greatest number of men of any organization in the world. He began as a laborer, became in succession stage driver, surveyor, superintendent and president, drawing the largest salary paid to the head of any enterprise.

Some Reminiscences of Lincoln.

Lincoln particularly liked a joke at the expense of the dignity of some high civil or military official. One day, not long before his second inauguration, he asked me if I had heard about Stanton's meeting a picket on Broad River, South Carolina, and then told his story: General Foster, then at Port Royal, escorted the Secretary up the river, taking a quartermaster's tug. Reaching the outer lines of the river, a picket roared from the bank, "Who have you got on board that tug?" The severe and dignified answer was, "The Secretary of War and General Foster." Instantly the picket roared back, "We've got major-generals enough up here—why don't you bring us some hardtack?" The story tickled Lincoln mightily, and he told it till it was replaced by a new one. Anything that savored of the wit and humor of the soldiers was especially welcome to Lincoln. There was a story of a soldier in the Army of the Potomac, carried to the rear of the battle with both legs shot off, who, seeing a pie-woman hovering about, asked, "Say, old lady, are them pies sewed or pegged?" And there was another one of a soldier at the battle of Chancellorsville, whose regiment, waiting to be called into the fight, was taking coffee. The hero of the story put to his lips a crockery mug which he had carried with infinite care through several campaigns. A stray bullet, just missing the coffee-drinker's head, dashed the mug into fragments, and left only its handle on his finger. Turning his head in that direction, the soldier angrily growled, "Johnny, you can't do that again!" Lincoln, relating these two stories together, said, "It seems neither death nor danger could quench the grim humor of the American soldier."—*Century Magazine.*

Lincoln's Patience and Humor.

Ward Lamon told this story of President Lincoln, whom he found one day in a particularly gloomy frame of mind. Lamon said:

"The President remarked, as I came in, 'I fear I have made Senator Wade, of Ohio, my enemy for life.'

"'How?" I asked.

"'Well,' continued the President, 'Wade was here just now urging me to dismiss Grant, and, in response to something he said, I remarked, "Senator, that reminds me of a story."'

"'What did Wade say?" I inquired of the President.

"'He said, in a petulant way,' the President responded, '"It is with you, sir, all story, story! You are the father of every military blunder that has been made during the war. You are on your road to hell, sir, with this government, by your obstinacy, and you are not a mile off this minute."'

"'What did you say then?'

"'I good-naturedly said to him,' the President replied, '"Senator, that is just about from here to the Capitol, is it not?" He was very angry, grabbed up his hat and cane, and went away.'"

Origin of the "Influence" Story.

Judge Baldwin, of California, being in Washington, called one day on General Halleck, then Commander-in-Chief of the Union forces, and, presuming upon a familiar acquaintance in California a few years since, solicited a pass outside of our lines to see a brother in Virginia, not thinking that he would meet with a refusal, as both his brother and himself were good Union men.

"We have been deceived too often," said General Halleck, "and I regret I can't grant it."

Judge Baldwin then went to Stanton, and was very briefly disposed of with the same result. Finally, he obtained an interview with Mr. Lincoln, and stated his case.

"Have you applied to General Halleck?" inquired the President.

"Yes, and met with a flat refusal," said Judge Baldwin.

"Then you must see Stanton," continued the President.

"I have, and with the same result," was the reply.

"Well, then," said Mr. Lincoln, with a smile, "I can do nothing; for you must know that I have very little influence with this Administration, although I hope to have more with the next."

Lincoln's Famous Letter to Hooker.

A remarkable and highly characteristic letter of Lincoln's was one which he wrote to General Hooker, just after the latter had taken command of the Army of the Potomac. It was quite long, occupying nearly four pages of large letter paper, and written in the President's own hand. In this letter the good Lincoln advised Hooker, in the most kindly, even affectionate manner, not in respect of military affairs, but as to his personal conduct, alluding to certain traits, particularly of character, which the President gently intimated, became faults when made too prominent. It was just such a letter of loving counsel as a father might write to a son—a letter forever to be prized by its recipient. Some weeks after this was written, I accompanied the President to the Army of the Potomac, then lying at Falmouth. We were entertained at Hooker's headquarters. One night, Hooker and I being alone in the hut, the General standing with his back to the fire-place, alert, handsome, full of courage and confidence, said laughingly: "B——, the President says you know about that letter he wrote me on taking command." I acknowledged that the President had read it to me. The General seemed to think that the advice was well meant but unnecessary. Then he added, with that charming assurance that became him so well: "After I have been to Richmond, I am going to have that letter printed." It is a good letter; it is a pity that it never was printed.—*Scribner's Monthly.*

Hobson's Choice.

Thomas Hobson was a carrier at Cambridge, England, and owning horses, he used to let them to students. He was a very humane man, and made a rule that every horse should have a regular time in which to rest, and no matter how much a student might want to hire a particular horse, he couldn't get him if it were his time to rest. So it was "Hobson's choice. Take what you can get, or go without."

Bismarck's Coolness.

Bismarck was no orator, like Gladstone, of England, or Gambetta, of France. But he was always master of himself, and of the subject on which he spoke. He showed his perfect coolness at the very beginning of his public career. In his first speech in the House of Deputies he hesitated and blundered, like Demosthenes in his first speech in the Athenian Agora, and Sheridan in his first appearance in the House of Commons. The two latter gave it up, and retired in shame, with, however, a determination to succeed in the future.

But Bismarck would not confess himself beaten. He was determined to win success from the start. When the Deputies laughed at him, hooted, hissed, and tried to compel him to sit down, he remained standing. As the storm grew more violent, he looked round in absolute composure, took a paper from his pocket, and read quietly until order was restored. Then he resumed his speech and finished it, having compelled the attention of the House. From that moment all felt that he was certain to succeed.

Pen-and-Ink Sketches of Henry Clay.

In person, Clay was tall and commanding, being six feet and one inch in stature, and was noted for the erect appearance he presented, whether standing, walking or talking. The most striking features of his countenance were a high forehead, a prominent nose, an uncommonly large mouth, and blue eyes, which, though not particularly expressive when in repose, had an electrical appearance when kindled. His voice was one of extraordinary compass, melody and power. From the "deep and dreadful subbass of the organ," to the most aerial warblings of its highest key, hardly a pipe or stop was wanting. Like all magical voices, it had the faculty of imparting to the most familiar and commonplace expressions an inexpressible fascination. Probably no orator ever lived who, when speaking on a great occasion, was more completely absorbed in his theme. "I do not know how it is with others," he once said, "but, on such occasions, I seem to be unconscious of the external world. Wholly engrossed by the subject before me, I lose all sense of personal identity, of time, or of surrounding objects." When Clay had acquired a national fame, a plain old country gentleman gave the

following toast at a Fourth-of-July dinner: "Henry Clay,—He and I were born close to the Slashes of old Hanover. He worked barefooted, and so did I; he went to mill, and so did I; he was good to his mamma, and so was I. I know him like a book, and love him like a brother."—*Political Orators.*

Anecdotes of Henry Clay.

A fresh anecdote of Henry Clay, or any of the wise and witty men who were his contemporaries, is always refreshing. When General Jackson appointed Mr. Buchanan to the mission at St. Petersburg, he inquired of Mr. Clay, at a party in Washington, what style of dress he should wear at the court of the Czar. Mr. Clay replied that as they were about of a size (Buchanan had not then grown so stout as he appeared later in life) the coat he wore as one of the United States Commissioners at Ghent was at his service.

"But it has been worn, Mr. Clay," was the response to the offer.

"Oh, that is nothing. You can turn it, Buchanan—you're used to it."

Mr. Clay never let pass an opportunity for a fling at Mr. Buchanan, after the latter had written his famous letter, charging bribery and corruption in the election of John Quincy Adams to the presidency of the House of Representatives. In the course of a speech in the Senate, Mr. Buchanan stated that when a young man he joined a volunteer militia company that marched from Lancaster to the relief of Baltimore, when the Monumental City was threatened by the British during the War of 1812. Upon reaching Hagerstown, however, the troops, learning that the invaders had been repulsed at North Point, returned home without further participation in the war. At this point Clay arose, and, addressing the Chair, expressed a desire to ask the speaker a question.

"Certainly," was the courteous response.

"I would like to inquire of the Senator from Pennsylvania," remarked the Great Commoner, with that inimitable twist of his catfish mouth, "whether the gentleman marched to the relief of Baltimore because he had learned that the British had left, or whether the British had left because they heard the gentleman from Pennsylvania was coming."

Effect of Daniel Webster's Oratory.

The accounts given of the effects wrought by some of Daniel Webster's speeches, seem almost incredible to those who never have listened to his clarion-like voice and weighty words. Yet even now, as we read some of the stirring passages in his early discourses, we can hardly realize that we are not standing by as he strangles the *reluctantes dracones* of an adversary, or actually looking upon the scenes in American history which he so vividly describes. Professor Ticknor, speaking in one of his letters of the intense excitement with which he listened to Webster's Plymouth address, says: "Three or four times I thought my temples would burst with the gush of blood; for, after all, you must know that I am aware it is no connected and compacted whole, but a collection of wonderful fragments of burning eloquence, to which his manner gave tenfold force. When I came out, I was almost afraid to come near him. It seemed to me that he was like the mount that might not be touched, and that burned with fire."—*William Mathews.*

The Timidity of Orators.

A writer of the *Fortnightly Review* asks whether artists, and especially orators, are peculiarly liable to the sensation of pain and to fear. He thinks that they are, and attributes it to an unusually sensitive organization. Peel is believed to have owed his death to being unable to bear an operation which a less sensitive man might have borne. An eminent operator described Bishop Wilberforce as a "bundle of nerves," and as the most sensitive patient he had ever known. Orators, as a rule, show a painful anxiety about their own speeches, and toilsome uneasiness seems a condition of their success. A junior counsel once congratulated Sir William Follet on his perfect composure in prospect of a great case. Sir William merely asked his friend to feel his hand, which was wet with anxiety. The late Lord Derby said that his principal speeches cost him two sleepless nights—one in which he was thinking what to say, the other in which he

was lamenting what he might have said better. Cicero, according to Plutarch, "not only wanted courage in arms, but in his speaking also; he began timidly, and, in many cases, he scarcely left off trembling and shaking even when he got thoroughly into the current and substance of his speech."

Oratory of Edmund Burke.

Among the most memorable displays of oratory, few are more familiar to the ordinary reader than those which took place during the trial of Warren Hastings, in Westminster Hall. It is said that when Burke, with an imagination almost as oriental as scenes he depicted, described in words that will live as long as the English language, the cruelties inflicted upon the natives of India by Debi Sing, one of Hastings' agents, a convulsive shudder ran through the whole assembly. Indignation and rage filled the breasts of his hearers; some of the ladies "swooned way"; and Hastings himself, though he had protested his innocence, was utterly overwhelmed. "For half an hour," he said afterward, in describing the scene, "I looked at the orator in a revery of wonder, and actually felt myself the most culpable man on earth."—*William Mathews.*

Power and Influence of the Orator.

When, in 1761, James Otis, in a Boston popular assembly, denounced the British Writs of Assistance, his hearers were hurried away resistlessly on the torrent of his impetuous speech. When he had concluded, every man, we are told, of the vast assembly, went away resolved to take up arms against the illegality. When Patrick Henry pleaded the tobacco case "against the parsons," in 1758, it is said that the people might have been seen in every part of the house, on the benches, in the aisles, and in the windows, hushed in death-like stillness, and bending eagerly forward to catch the magic tones of the speaker. The jury were so bewildered as to lose sight of the legislative enactments on which the plaintiffs relied; the court lost the equipoise of its judgment, and refused a new trial; and the people, who could scarcely keep their hands off their champion after he had closed his harangue, no sooner saw that he was victorious, than they seized him at the bar, and, in spite of his own efforts, and the continued cry of "Order!" from the sheriff and the Court, bore him out of the court-house, and, raising him on their shoulders, carried him about the yard, in a kind of electioneering triumph. When the same great orator concluded his well-known speech in March, 1775, in behalf of American independence, "no murmur of applause followed," says his biographer; "the effect was too deep. After the trance of a moment, several members of the assembly started from their seats. The cry, *To arms!* seemed to quiver on every lip, and glance from every eye.—*Orators and Oratory.*

An Actor's Triumph.

There was once an English actor so terribly in earnest with the study of his profession that he made a mark on his generation never exceeded by any other tragedian. He was a little, dark man, with a voice naturally harsh, but he determined, when comparatively young, to play the character of Sir Giles Overreach in Massinger's drama as no other man ever played it before. He resolved to give years of indefatigable industry in preparing himself for the part, and to devote his whole intellect to a proper conception of the character. In the whole range of English dramatic literature the character of Sir Giles is estimated one of the greatest pieces of effective villainy and untamable passion ever portrayed, and little Edmund Kean set himself to the task of producing on the London stage all the effect which the author intended. With what intensity he studied the language, how he flung himself with a kind of rage into the feeling of the piece, all his biographers have recorded. His wife said that he would often remain up all night, before the pier-glass, endeavoring to realize by gesture, modulation and action the conception at which he had arrived. At last, after repeated refusals to the management to appear as Sir Giles, saying he was not ready yet and must still give more time to the rehearsal, he consented to have the play announced, as now he felt he could do it justice. And what was the effect of all this hard work and unceasing

study of the part? Fortunately we know all about it, although Kean played it on that memorable evening, nearly 100 years ago. It was one of the grandest effects ever witnessed on the English stage. We have accounts from various eye-witnesses of the sensation and the enthusiasm the presentation of this character produced, when Kean, fully ripe for the occasion, came upon the stage as Sir Giles; and some of the triumphs of that wonderful evening in 1816, at Drury Lane, are well known. It was observed that when he first walked in from the wings there was that in his burning eye which betokened greater determination than usual, and Lord Byron, who was in a stage-box, whispered to the poet Moore that something dreadful was written on the great actor's countenance, something more suggestive of power even than he had noticed before. And never till then in the history of the stage was there witnessed such an exhibition of forceful endeavor.

Throughout the whole play Kean bore himself like a fury; but it was reserved for the last scene to stamp an impression which existed during the lifetime of all who were present. The great actor himself shook like a strong oak in the whirlwind of his passionate vengeance, as displayed in the closing sentences of the play, and when he was removed from the stage his face, turned to the spectators, was so awful that Byron was seized with a convulsive fit and fell forward, pale as death itself. The solemn stillness of the house was broken by screams of terror from boxes and gallery; the pit rose *en masse*. Mrs. Glover, an actress of long experience and great talent, fainted outright on the stage; Mrs. Horn, who was also playing in the piece, staggered to a chair and wept aloud at the appalling sight of Kean's agony and rage. Munden, a veteran on the boards, who played the part of Marall, stood so transfixed with astonishment and terror that he had to be carried off by main force from the scene, his eyes riveted on Kean's convulsed and awful countenance. The actor that night was master of the situation, and profound and earnest study gave him the clue to his great achievement.—*Jas. T. Fields.*

Wesley and Whitfield's Courage of Faith.

Of the memorable incidents connected with the Foundry, the earthquake of 1750 is still recorded. On the 8th of February all London rocked to and fro with a strong convulsion, and the people rushed into the streets to avoid being buried in the tottering houses. A month later, when Charles Wesley was holding the 5 o'clock morning service at the Foundry Chapel, a far more violent shock passed beneath the city. The earth moved westward and eastward, and then westward again, followed by a loud noise like thunder. Wesley had just given out his text when the Foundry was shaken violently, as if the roof would fall. The women and children cried out, but the preacher, changing his text, read aloud, "Therefore we will not fear, though the earth be moved," etc., and soon filled his audience with his own unshaken courage. The general terror rose almost to madness when an insane prophet declared that on the 4th of April another earthquake would level London and Westminster to the dust. A wild excitement raged through the city as the fatal day approached. Thousands fled to the country. Women and children ran through the streets on the night before the 4th of April, weeping and lamenting. London looked like a city sacked and ruined. Every open space was filled through the anxious night with multitudes of the rich and poor, awaiting the expected shock. The churches were crowded with unaccustomed worshipers. Whitfield stood up in Hyde Park at midnight, under an inclement sky, and spoke with his sonorous voice to an uncount multitude; and Charles Wesley, surrounded by immense throngs at the Foundry, preached a "written" sermon and chanted some inspiring hymns. The next day passed in quiet. The people came back to their houses, and London has never since felt so universal a terror as that of the year of the earthquakes.—*Eugene Lawrence, in Harper's Magazine.*

Character of Jay Gould.

(Sketch written during his life by one who studied his character.)

He appears to be a man whom nothing would excite; and one of his brokers says you never can tell from his expression when he reads a telegram whether he has made five millions or lost ten. He is, on the whole, the most incomprehensible of New Yorkers. He is an embodiment of the money-making faculty. It would be a hard question to tell what Gould is worth. I know men who believe he is to-day the richest citizen in New York. I know others who are confident he is not worth over a million, and others who do not hesitate to pronounce him on the eve of bankruptcy. But this last is preposterous. He is incessantly engaged in great operations, and these cannot be managed without vast sums. He is determined no one shall be acquainted with his affairs. Despite his outward immobility, the strain of his colossal operations upon his brain and nerves cannot be otherwise than very wearing. It is said that he is troubled with sleeplessness, and that many of his gigantic schemes are worked out in bed while he is lying awake. Occasionally he gets up at night, lights the gas, walks the floor, and tears paper into bits. It may be remembered that Fisk testified on his investigation by the Congressional Committee, respecting the transactions of Black Friday, that he observed Jay Gould tearing up paper and throwing the pieces into the wastebasket, and that then he knew his partner had some work on hand. He scarcely ever smiles, and never lifts his voice above a conversational tone. He has no friends, as far as known; but a host of enemies. His life is in great speculations. His greatest crime in the eyes of his fellow-speculators is that he succeeds in doing to Wall Street what Wall Street is perpetually trying, but in vain, to do to him. —*The Chicago Times.*

Anecdote of Rothschild.

It is related of Nathan Mayer Rothschild, that, all day long, at the Battle of Waterloo, he hung about the skirts of the two armies, waiting to see how the battle turned. Toward night of that memorable day, the clouds of smoke lifting, revealed the French army in full and disastrous retreat.

Rothschild took in the situation at once. True to his instincts, he saw in the awful carnage only the shimmer of his gold. Chance had overcome the most heroic valor, the most stubborn resistance, the best-laid plans, and once more declared in the Hebrew's favor. He dashed into Brussels, whence a carriage in waiting whirled him into Ostend. At dawn he stood on the Belgian coast, against which the sea was madly breaking. He offered five, six, eight, ten hundred francs to be carried over to England. The mariners feared the storm; but a bolder fisherman, upon promise of twenty-five hundred francs, undertook the hazardous voyage. Before sunset Rothschild landed at Dover, and, engaging the swiftest horses, rode with the wind to London. What a superb special correspondent he would have made!

The merchants and bankers were dejected; the funds were depressed; a dense fog hung over the city; English souls had sunk into their pockets. On the morning of the 20th, the cunning and grasping Nathan appeared at the Stock Exchange, an embodiment of gloom. He mentioned, confidentially, of course, to his familiars that Blucher, at the head of his vast army of veterans, had been defeated by Napoleon at Ligny on the 16th and 17th, and there could be no hope for Wellington, with his comparatively small and undisciplined force. This was half true, and, like all half-truths, was particularly calculated to deceive. Rothschild was a leader among trading reynards. His doleful whisper spread as the plague—poisoning faith everywhere. The funds tumbled like an aerolite. Public and private opinion wilted before the simoon of calamitous report. It was Black Friday anticipated in Lombard Street. The crafty Israelite bought, through his secret agents, all the consols, bills and notes he could raise money for. Not before the afternoon of the 21st—nearly forty-eight hours after the battle—did the news of Wellington's victory reach London through the regular channels. Rothschild was at the Exchange half an hour before the glad tidings were made public, and imparted them to a crowd of greedy listeners. The

Bourse was buoyant. Everything went up more rapidly than it had gone down. England was happy—as well she might be—for she had stumbled into the greatest triumph in her history. When merchants and bankers shook hands with the Hebrew speculator, they noticed—though they did not understand—an unusual warmth of pressure. It was not rejoicing with the nation; it was the imaginary clutching of six millions more of gold.—*Junius Henri Browne, in Harper's Magazine.*

Mr. Rockefeller Dreads Debt.

John D. Rockefeller, the "Oil King," whose wealth touches the $125,000,000 mark, won his first start in a business way by working on a New York farm twelve hours out of twenty-four for twenty-five cents a day. He has earned his position as a multi-millionaire by adhering to the principles of the following maxims:

1. It should be every man's duty to get all the money he can, keep all he can, and give away all he can.

2. Buy only what he can pay for, and look upon debt as an ogre that first paralyzes and then kills.

3. Live within your means, and don't think too much of your neighbor's good fortune.

4. Keep a record of all expenditures and receipts, so that at the end of each year you can tell whether you are saving enough money to provide against the inevitable rainy day. Any one can make money; few can save it.

5. Live as though every act of yours was under the scrutiny of your bitterest enemy.

Foresee misfortunes that thou mayest strive to prevent them; but whenever they happen bear them with magnanimity.—ZOROASTER.

Mental pleasures never clog; unlike those of the body, they are increased by repetition, approved by reflection and strengthened by enjoyment.—COLTON.

Mayor Stephen Allen's Rules.

The following newspaper clipping was found in the pocketbook of Stephen Allen, formerly a mayor of New York. The clipping, after serving the needs of Mr. Allen, has been carried in the pocket of another merchant ever since he was a boy, and he says he has always found its counsels good, and tried his best to follow them:

Never be idle.
Make few promises.
Always speak the truth.
Never speak evil of any one.
Keep good company or none.
Live up to your engagements.
Good character is above all else.
Earn money before you spend it.
Be just before you are generous.
Drink no kind of intoxicating liquors.
Keep your own secrets, if you have any.
Keep yourself innocent if you would be happy.
Make no haste to be rich if you would prosper.

Mr. Carnegie to Young Men.

He says "The Blessed Heritage of Poverty" is the Best Education with which to Begin Life.

Andrew Carnegie, in a talk on "Stepping-Stones to Success in Business," to a young men's organization in New York, lately, said:

"I am going to give you a few points in my own life. As a young man I had the best education in the world with which to begin life, for I was born to the blessed heritage of poverty. I hope the burden of riches has not fallen on the young men here. When this burden is laid on a young man he has temptation at every step of which the poor man knows nothing, and if he acts his part well he deserves double credit. He is surely the salt of the earth.

"You hear a great deal about poverty nowadays, and the cry goes up to abolish poverty, but it will be the saddest day of civilization when poverty is no longer with us. It is from the soil of poverty that all the virtues spring. Without poverty where will your inventor, your artist, your philanthropist come from? God does not call His great men from the palaces of the rich.

"Fortunately, being poor, I was not compelled to make a choice of my career. It was not what I wanted, but what I could get. I have scribbled with the pen and have been a journalist, although I hope not of the yellow press. I was made a man at

thirteen when I brought $1.20 which I had made with my own hands.

"To succeed a young man must be honest, moral and sober. You cannot trust a drinking man, and I would as soon trust the man who gambles at Monte Carlo as the man who gambles in Wall Street. The successful business man must be a good, all-around man, and must not do anything to excess. Business is affected by the small things in life. Events in far-off climes affect the business status in this and every other country. All wars and the awful massacres which accompany them, whether they take place on this continent, or in the far away islands of the sea, have their effect upon our business.

"The real advantages of wealth are what it will enable you to do for others. But of every thousand dollars given to charity nine hundred and fifty might as well be thrown in the sea. Help the aspiring. It is of no use to boost a man up a ladder unless he is willing to climb himself.

"There are three classes of young men in the world. One starts out to be a millionaire. Another seeks reputation, perhaps at the cannon's mouth. A third young man, who will be successful, is he who starts out in life with relf-respect and who is true to his own self and to his fellow-men. He cannot fail to win."

John D. Rockefeller was an interested listener, and suggested that everybody present shake hands with the speaker.

McKinley Not Given to Humor.

It is said that the late President McKinley was always so much in earnest that he never essayed humor. Some time after his elevation to the Presidency a New York magazine sent a representative to Canton with instructions to secure a story on McKinley humor. The young man spent nearly two weeks interviewing the President's life-long friends, and was compelled at last to leave without material. There was no McKinley humor.

"I have yet to find a man who has heard McKinley tell a comic anecdote," he wrote. "He seems to enjoy humor as much as any one, but never appears as a source of amusement. One could conceive that he might have a reluctance to appear as a comedian since he is the Chief Executive, believing it incompatible with the dignity of the office. But even in his early days in politics I can find no record of his relating stories. In any event, that is the result of my investigation, and I am ready to give up the trial." But that there was a vein of humor underlying his serious nature is shown by the following:

JOKE OF THE CUSPIDOR.—The little town of Oberlin, Ohio, is probably one of the straitest-laced places in America. It is the home of a university, and the town-fathers have so jealously guarded the morals of the young people that not only is the sale of liquor prohibited, but even tobacco is unknown in the stores. A Mr. Monroe, at one time a Congressman from the Oberlin district, was in the habit of entertaining all the political leaders who visited the place, and during Mr. McKinley's first gubernatorial campaign he stopped at Mr. Monroe's house.

After dinner Mr. McKinley took a cigar from his pocket and casually remarked to his host that if he did not mind he would have a smoke. Mr. Monroe looked aghast, but not desiring to appear inhospitable and yet dreading the social ostracism which he would doubtless suffer if a guest should be seen smoking on his piazza, he conducted Mr. McKinley to a back balcony on the second floor, where he was screened from the public view, and told him to go ahead. McKinley lighted his cigar, and leaning back in his chair called for a cuspidor, as all good smokers do.

"Why, there is not such a thing in town," replied Mr. Monroe, and the coal bucket was pressed into service.

Soon after the meeting Mr. McKinley spoke at East Liverpool, which is a great pottery centre. He mentioned his experience to a friend who was the proprietor of one of the big potteries there, and then said:

"By the way, Taylor, just for a joke send a gross of your china spitoons to Mr. Monroe. Don't tell him where they came from or he will suspect that I had a hand in it."

Colonel Taylor immediately crated a beautiful assortment of chinaware and sent it to Oberlin. A year later McKinley was again a guest at Mr. Monroe's house. He went

EDISON AND HIS GREAT INVENTION

The invention of the phonograph is probably the most marvelous invention of recent years. The discovery of the principle of vibration in metal, due to sound of voice, is said to have been due to chance. Edison saw the possibility and achieved additional fame

with a liberal supply of good smoking material and soon asked for the back balcony. Lighting a cigar, he remarked:

"You haven't a cuspidor in town yet, have you, Monroe?"

"Well, now, that is funny," replied his host; "but a few days after you were here last year some one sent me a whole crate of those things. Of course I had no use for them, and they were such nice china and so prettily painted that my wife used them all for flower-pots. There is not one about the house that is not in use."

ANOTHER EXCEPTION.—The statement that there was never any McKinley humor is further disproved by an incident that occurred while he lay on his death-bed. On Monday after the tragedy in Buffalo, when everybody about the house was happy over the apparent improvement in the President's condition, the doctors in his room were feeling his pulse to obtain the necessary data for a bulletin. "The President kept up a running conversation with us," said one of the physicians afterwards in telling the story, "and, for very good reasons, we did not want him to exhaust his strength uselessly. One of the doctors stepped to the bedside and said: 'Mr. McKinley, you are not to talk. We have decided you must not talk.' The President's dark eyes were bent on the one who gave the order, and, without moving a muscle of his face, he said:

"'You gentlemen think you don't have a chance to boss the President of the United States often and you are improving your opportunity.'"

Sir William Hamilton's Stories of Great Memories.

Sir William Hamilton tells some huge stories in his lectures on Memory. Ben Johnson could not only repeat all he had ever written, but whole books he had read! If we had his faculty, we should pray to be delivered from the full exercise of it. Niebuhr, in his youth, was employed in one of the public offices of Denmark, where part of a book of accounts having been lost, he restored it from his recollection. Seneca complains of old age because he cannot, as he once did, repeat two thousand names in the order they were read to him, and avers that, on one occasion, when at his studies, two hundred unconnected verses having been pronounced by different pupils of his preceptor, he repeated them in a reversed order from the last to the first uttered. A quick and retentive memory, both of words and things, is an invaluable treasure, and may be had by any one who will take the pains. Theodore Parker, while in divinity school, had a notion that his memory was defective and needed looking after, and he had an immense chronological chart hung up in his room and tasked himself to commit the contents—all the names and dates, from Adam and the year 1 down to Nimrod, Ptolemy, Saxter, Heliogabulus and the rest. Our verbal memory soonest fails us, unless we attend to it and keep it in fresh order. A child will commit and recite verbatim easier than an adult, and girls than boys. To keep the verbal memory fresh, it is capital exercise to study and acquire new languages, or commit and treasure up choice passages, making them a part of our mental wealth.

There was a negro girl in Brucetown, Ky., about nine years of age, whose memory was truly marvelous. Her wonderful powers were first brought to the notice of a white man, who kept a grocery in that part of the city, some time ago. He had been reading aloud in her presence the day before, and accidentally heard her repeat, word for word, what he had read from the paper, though twenty-four hours had intervened.

After this he tested her memory frequently, and found her capable of repeating thirty or forty lines from a book after hearing it read over once. Her intellect in other respects did not seem at all above, if equal to, the average. Such instances of memory are not at all unusual. Mary Summerville tells of an idiot in Edinburgh who never failed to repeat the sermon, word for word, after kirk each Sunday, saying, "Here the minister coughed, here he stopped to blow his nose," etc.

Blind Tom's Wonderful Memory.

Blind Tom, the famous negro pianist, knew nothing of the notes or theoretical music. But he remembered every sound he

heard, even when an infant. His musical genius was discovered by his young mistress (he was born a slave) one day, when she returned after a short absence from the parlor and found the negro child of not yet six years sitting at the piano in an ecstacy of delight, playing perfectly the music she had played a few minutes before in his hearing. Blind Tom could always repeat any music played in his hearing. He also remembered speeches word for word and imitated exactly the tones of the orator. Thousands have heard him repeat one of Stephen A. Douglas' great orations, which he heard when quite young from the lips of the distinguished man. Tom's intellect is of a very low order.

Interesting Facts About the Human Family.

The average man's greatest weight is attained at about forty years of age; that of woman, about fifty. At sixty years the weight usually declines until it equals the average weight at nineteen years.

It has been computed that nearly two years' sickness is experienced by every person before he is seventy years old, and therefore that ten days per annum is the average sickness of human life. Till forty it is but half, and after fifty it rapidly increases. The mixed and fanciful diet of man is considered the cause of numerous diseases from which animals are exempt. Many diseases have abated with changes of diet, and others are virulent in particular countries, arising from peculiarities.

Human Longevity.—Of 100,000 male and female children, in the first month they are reduced to 90,396, or nearly a tenth. In the second, to 87,936. In the third, to 86,175. In the fourth, to 84,720. In the fifth, to 83,571. In the sixth, to 82,526, and by the end of the first year, to 77,528, the deaths being 2 to 9. The next four years reduces the 77,528 to 62,448, indicating 37,552 deaths before the completion of the fifth year.

At twenty-five years the 100,000 are half, or 49,995; at fifty-two, one-third. At fifty-eight and one-half, a fourth, or 25,000; at sixty-seven, a fifth, at seventy-six, a tenth; at eighty-one, a twentieth, or 5,000; and ten attain one hundred. Children die in large proportions because their disease cannot be explained, and because the organs are not habituated to the functions of life. The mean of life varies in different countries from forty to forty-five. A generation from father to son is about thirty years; of men in general, five-sixths die before seventy, and fifteen-sixteenths before eighty. After eighty it is rather endurance than enjoyment. The nerves are blunted, the senses fail, the muscles are rigid, the softer tubes become hard, the memory fails, the brain ossifies, the affections are buried, and hope ceases. The sixteenth die at eighty, except a one hundred and thirty-third at ninety. The remainder die from inability to live, at or before one hundred.

About the age of thirty-six the lean man usually becomes fatter and the fat man leaner. Again, between the years forty-three and fifty his appetite fails, his complexion fades, and his tongue is apt to be furred on the least exertion of body or mind. At this period his muscles become flabby, his joints weak; his spirits droop, and his sleep is imperfect and unrefreshing. After suffering under these complaints a year, or perhaps two, he starts afresh with renewed vigor, and goes on to sixty-one or sixty-two, when a similar change takes place, but with aggravated symptoms. When these grand periods have been successively passed, the gravity of incumbent years is more strongly marked, and he begins to boast of his age.

In Russia, much more than in any other country, instances of longevity are numerous, if true. In the report of the Holy Synod, in 1827, during the year 1825, and only among the Greek religion, 848 men had reached upwards of 100 years of age; thirty-two had passed their 120th year; four from 130 to 135. Out of 606,818 men who died in 1826, 2,765 were above ninety; 1,432 above ninety-five; and 848 above 100 years of age. Among this last number eighty-eight were above 115; twenty-four more than 120; seven above 125; and one 130. Riley asserts that Arabs in the Desert live 200 years.

THE WIZARD OF MENLO PARK

THE RAILROAD NEWSBOY BECOMES THE MAGICIAN OF ELECTRICITY AND THE INVENTOR OF THE PHONOGRAPH AND A HUNDRED OF OTHER WONDERFUL INVENTIONS.

"I never did anything worth doing by accident, nor did any of my inventions come indirectly by accident.—*Thomas A. Edison.*

It has been said of Thomas Alva Edison that "he is the most remarkable inventor who ever lived. The lesson of his life is found in the fact that he has proved that invention is an art and not a happy guessing; that discovery comes from a wise search, not from a drifting in the fogs of ignorance. His life is the greatest incentive to the young to be found in modern history. It teaches to work; it points out the new path, at once laborious, scientific, exact, and ending at success."

An Enterprising Eager Boy can Find a way Where Others Fail to See One.

Edison began life in the usual way as a boy, but not as the usual boy. It would be hard to find a boy more versatile, enterprising, ready for contingencies, or eager for information than he. His school-life embraced but a few weeks, but such was his thirst for knowledge that at ten years of age he was reading Gibbon's "Rome," Hume's "History of England," and, of all books for a boy of ten, such a work as Burton's "Anatomy of Melancholy." At twelve, he plunged to the depths, in reading Newton's "Principia." He confesses that he did not understand it—as a host of men three times his age might, without blushing, confess. The ambitious boy was smitten with the idea that by reading all books, all knowledge could be had, and he actually set to work to read through the Detroit Free Library. He had read along some fifteen feet of the well-stocked shelves, taking the books as they came, when the librarian noticed him and learned from him the stupendous task he had set himself to perform. A few words of judicious advice on the use and abuse of reading taught the boy a lesson, and put him upon a wiser course.

He was as original in his work. Beginning at the age of twelve as newsboy on the Grand Trunk Railroad, his first enterprise was after the battle of Pittsburg Landing,

when he induced the telegraph operators to announce on their bulletin boards that the *Detroit Free Press* would have a full account of the fight. Then he persuaded the publishers to trust him with a thousand copies. These he began to sell at the rate of two for five cents. At the next station he raised the price to ten cents each, and, finding that they sold the faster as the price went up, at the third station he disposed of the remainder at twenty-five cents apiece. It was not long before the energetic boy had a newspaper of his own, the *Grand Trunk Herald*, set up and printed on a little press in the car. It was the only newspaper ever published on a railway train. Another of the boy's fancies was for chemical experiments, which he conducted also in his end of the baggage car. As a result, he succeeded in setting the car on fire by an explosion, the outcome being that an irate brakesman kicked his laboratory and newspaper press out of the car, and boxed him so savagely on the ear as to deafen him for life on that side of his head.

Not Afraid to Work at Night to Learn Telegraphy

Edison's next line of study was in telegraphy. This arose from his saving the child of a station master from being run over by a train. In gratitude the father taught him the telegraphic art, which he, studied at nights, after his day's work. At sixteen he was the best operator on the line. One notable story told of his quickness of wit was on an occasion when it was essential to send word without delay across the river to a train on the Canadian side. He did it by tooting out the Morse signals on a locomotive whistle. An operator on the other side caught on to the idea and responded, and the desired news were quickly sent.

There is infinite promise in a boy like this. Edison's originality, enterprise and inventive faculty were of an extraordinary character, and could not fail to yield marked results. He was incessantly active, constantly trying something new, reading, thinking and experimenting, and storing his mind for a great career in invention. His newsboy life was followed by a period as a telegraph operator, in which he became remarkably expert. He worked his way from point to point, finally reaching Boston. In connection with this a good story is told, one well worth repeating. At that time there was an operator in New York, on the line between that city and Boston, who sent news with such lightning speed that the Boston operators found it no easy matter to take down his messages. When Edison walked into the Boston office, a tall, gawky, ill-dressed youth, just twenty-one—the operators wondered what sort of a backwoods importation this was. Learning that he had been engaged as an operator, one of them slily wired to the New York fast sender, upon whose wire they placed the new comer, —"Greenhorn at this end of your line. Rattle him."

Never Judge a Man By His Looks, Try Him First.

The New Yorker began sending a long message at his best speed, expecting every minute to be checked by a signal of distress. His comrades looked on in amazement, and the Boston man did the same. All expected to see the new hand in trouble, but he serenely took the message as it came. Faster still the sounder rattled. Then came a signal from Boston and a smile went round both rooms.

"Say, New York," it ticked out.

"Well?" asked the fast operator, with a grin of triumph.

"Hurry up, can't you?" said Boston. "You send so slow, you make me tired."

The New Yorker nearly fell from his chair in astonishment.

"Who the devil are you, Boston?" he asked.

"My name is Tom Edison. Shake hands, old man, and try it again."

There was no more smiling after that. This story may have been dressed up by some one with an active imagination, but it is good enough to be kept in circulation.

Wherever young Edison went he managed to keep up his experiments in chemistry, usually having a little shop of his own. In Boston he found this more profitable than operating, the result of his studies being

his first great invention, that of an improved duplex and a quadruplex system of telegraphy. This important method of augmenting the carrying capacity of a wire proved easier to invent than to introduce. About 1870 he failed in an effort to work his duplex system between Rochester and Boston. Out of pocket and out of heart, he made his way to New York, with the vague hope that something might turn up. One day, when in the office of the Gold and Stock Company, the apparatus gave out and the brokers were in no little of a flurry. Edison offered to make it work, and the officials, with little hope of success, told him to try. They were so delighted with his quickness in setting the wires right that they made him their superintendent and the beginning of his fortune was made.

A Patent Which Brings $40,000 is the Foundation of a Fortune.

From that time on his career was one of successful invention. His first production was a printing telegraph for gold and stock quotations, which proved the foundation of his fortunes, as he sold the patent to the Western Union Company for $40,000. Such a sum was a landslide of sudden wealth. The check given him was like a white elephant on his hands. He was told that he could get the cash at the Bank of America.

"I started out," he says, "after carefully folding up the check, and went towards Wall street. So uncertain was I of that way of doing business that I thought while on the way that if any man should offer me two crisp thousand dollar bills for that piece of paper I would give it up very quick."

When he stood hesitatingly before the keen eyes of the teller he felt more doubtful than ever. Something was said on his deaf side which he did not catch; but, satisfied now that the paper was not good for the money, he went back with it to the office of the company.

General Lefferts, the President, with a smile at his story, now sent a man to identify him.

"This is Thomas A. Edison, whose name is on that check," said the messenger to the teller.

"Very good. How will you have your money, Mr. Edison?"

"In any way, so I get it."

It was handed him in large bills, which he divided into two wads, thrust one into each of his trousers' pockets, buttoned his coat tightly over them, and made all haste out of Wall Street. With this money he set up a work-shop at Newark, New Jersey. But, finding that business cares interfered with his experiments, he abandoned the shop in 1876, and set up a laboratory for experiment at Menlo Park, a New Jersey locality about twenty-four miles from New York. This place became the scene of an inventive activity and progress perhaps unequalled in the history of the world. His inventions in telegraphy were added to rapidly, until he could count over fifty patents in this field alone. The practical application of electricity in general also attracted his attention, especially the improvement of the telephone and the electric light, then recently invented. In his efforts to perfect the incandescent light, he made a multitude of experiments with vegetable substances in order to discover the best carbon filament. He also invented a system of dividing the current between a number of lamps on a single circuit, and in 1879 he exhibited the new system at Menlo Park, the electric light being successfully subdivided for the first time. The Edison Electric Light Company was established in New York in 1878, and there and elsewhere has grown into a very large and profitable business.

Accident Seldom Brings Real Success in Business or Pleasure.

At a later date Edison removed his laboratory to West Orange, New Jersey, where his inventive activity was kept up. We can only refer here to some of the most striking of his hundreds of inventions. Comparatively few of those are of commercial value, but some of them have added remarkably to the useful possessions of mankind. Chief among those is the wonderful phonograph. It came, in a sense, as an accident in his studies on the telephone, but it was one of those accidents whose significance it takes an Edison to perceive.

Of this, Edison has said: "I never did anything worth doing by accident, nor did any of my inventions come indirectly by accident, except the phonograph. When I have decided that a result is worth getting, I go at it and keep at it till it comes."

This method of recording the sounds of the human voice and reproducing them at will has as yet been largely of the nature of a toy, but it is being utilized in business and is full of striking possibilities in the time to come. In 1887 he set himself to develop the principle of the zeotrope, in which a graded succession of pictures are whirled round so as to give the impression of a single moving object. Instantaneous photography opened an opportunity for obtaining a far more perfect and complete series of pictures than could be produced by drawing, the rapidly succeeding phases of motion in man or other moving objects being reproduced in their finest details. His experiments upon this continued for six years, and ended in the perfecting of the moving picture, now known as the biograph, kinetoscope, and by other titles. Edison's idea was to show it in connection with phonographic reproductions of the voices or sounds belonging to the scene displayed. We have the final result of his labors in the remarkable living picture of to-day, as improved by later inventors, and now shown magnified upon the screen before large audiences.

One of Edison's later inventions was a method of obtaining iron, when present in small particles, by means of magnetic attraction. Large and expensive works were put up to utilize this idea, though as yet they do not seem to have been very successful. Still later is his new storage battery for electricity. This replaces the lead of the battery now in use by nickel and iron, and is claimed to be much lighter than the lead batteries, or capable of giving three or four times as much power for the same weight. It is just what is wanted as a light source of power for the automobile.

Edison has all his life been an indefatigable worker. "For fifteen years I have worked on an average of twenty hours a day," he has said. Later, he took things easy. "I do not work hard now," he remarked. "I come to the laboratory about eight o'clock every day, and go home to tea at six, and then I study or work on some problem till eleven, which is my hour for bed." Some would consider this more work than life is worth living for.

Edison has been well named "The Wizard of Menlo Park." As a multitudinous inventor his life has been without parallel. His intellectual powers are of no ordinary kind, but his great success has been due less to genius than to ceaseless activity and indomitable perseverance in the face of every discouragement. Those are the most remarkable characteristics of his nature and may be looked upon as the real elements of his success.

Everyday Wisdom.

"If you find the rock of impossibility in your path, go around it, rather than beat yourself to death against it, but still persevere."—*Grover Cleveland.*

"Of two grades of employment, if you have a choice, it may be well to accept that in which there is a prospect of growth and preferment, rather than one where promotion and development are impossible or less likely to follow good service—even though your choice may appear to involve a sacrifice of temporary present advantage."

—*Grover Cleveland.*

"I am so impressed with the motive power of a strong will, undaunted perseverance, unfailing and courageous self-reliance, exalted aims and an uncorrupted and incorruptible conscience, that I cannot see failure where these are present."

—*Grover Cleveland.*

"In this happy land there are no unpassable gulfs in business or in society. There are bridges."—*Benjamin Harrison.*

"If it is honorable to employ a man to do any particular service, it must be honorable to do it."—*Benjamin Harrison.*

"The only way in this free land to be assured of one's free rights is freely and generously to acknowledge other people's rights."—*Benjamin Harrison.*

"A man whose work praises him should not miss a man to praise the work."

Benjamin Harrison.

INFLEXIBLE HONESTY, INSPIRED DARING AND A STERN RESOLVE TO ACT LEAD TO GREATNESS

The qualities which brought Theodore Roosevelt greatness and popularity were partly born in him and partly cultivated by him. They are those of inflexible honesty, inspired daring, and a stern resolve to act, in every position of life in which he may be placed, for honor and duty rather than for personal advantage. It is by these traits of character that he has won the respect and admiration of the people, and these it is, with the addition of energy and industry, that have raised him to his exalted station—reached, as it was, through a national misfortune, a few years earlier than it would probably have come in the natural course of events. During his life in the West the qualities spoken of gained their development.

Mapping Out a Strenuous Life.

In 1883 the town of Little Missouri, on the Northern Pacific Railroad, in the heart of the "Bad Lands" of Dakota, was a disreputable example of the "Wild and Woolly West." It contained some of the worst outlaws that the border lands of civilization could show. Thither came a young man from the East, short of sight but big of heart, weak of frame but strong of will, seeking health and strength in the "strenuous life" he had mapped out for himself on the Western plains. Born to wealth and reared in plenty, the "tenderfoot," as doubtless the inmates of Little Missouri regarded him, quickly threw aside the social habits of the East. He had come to live in the West the life of the West. Leaving the town with one man and a pack-outfit, he hunted far and wide through mountain and plain, seeking the wild game and fishing in the mountain streams of that country. In this career as a sportsman he took pot-luck with his companions, living the rough life of a frontiersman. He killed the game for his own table, did his own cooking, saddled his own horses, acted as his own scout, and insisted on doing his full half of the night-work of frontier life. Not a thought of shirking his duty seemed ever to come to him. Such a career did much to strengthen that self-reliance and personal courage which were two of his most distinctive qualities.

Growing weary at length of the hunting life, business began to appeal to him, and he decided to engage in the cattle-raising enterprise. He was told by men of experience that the "bad lands" were not suited to ranching; cattle could not be wintered there. This he disputed. The finest wild game was to be found there; why would not cattle, he asked, thrive under the same conditions? At any rate he resolved to put it to the proof, and in the spring he shipped

to Little Missouri several hundred head of cattle, hired cow-boys, purchased mess-wagons and provisions, and drove the cattle from the cars to his range in the very heart of the "bad lands." There he asked of his men nothing he was not ready to undertake himself. He faced the blizzards of the West while rounding up the cattle for safety. Son of fortune as he was, he did his share of the night-herding, broke his own horses, slept at night with his saddle for a pillow, and, perhaps, the snow for a blanket, eat the same rough fare as his employees,

"We need men of character, by this I mean men who are honest and courageous."—*Theodore Roosevelt.*

and by his indomitable will, courage and endurance won the deep affection and respect of his men.

A Just and Fearless Man Has a Wholesome Influence in His Community.

The country in which his ranch was situated, at the period in question, was one without a counterpart in the polished and law-abiding East. It was the habitat of horse thieves, stage robbers, desperadoes, and criminals in general. Doubtless many of them looked on this "tenderfoot" from the East as an excellent subject for their peculiar practices. Lawlessness and depredation were visited upon each newcomer, the only sure redress being in the ability of the injured party to protect himself and punish the marauders. Those worthies were not long in finding that Theodore Roosevelt was not the man to be played with, and soon judged it better for their health to let him alone. His influence and example did much toward civilizing the locality, whose lawless people found him to be an absolutely just and fearless man, with plenty of nerve, and handy with gun and fists. No person ever stole a hoof of his cattle or horses, without being captured and punished according to the laws existing.

One instance of his readiness to take care of himself, resent injustice, and stand firm for the interests of himself and his men, is shown in Marquis De Mores affair, still vividly remembered in that country.

Marquis De Mores was a Frenchman by birth and a western ranchman through preference. Bringing with him the reputation of a ready duelist, he took up a ranch some miles away from that of Roosevelt. Although an honorable man, he believed in governing the country by force, and it was the popular impression that the cowboys in his employ were "killers" and ready to fight at the drop of the hat. He established his headquarters in a town called Medora, and there, soon after, Roosevelt's cowboys and those in his service became involved in a dispute over some cattle, which resulted in a pitched battle between the disputants. Victory, and a decisive one, was gained by the Roosevelt troop. De Mores's anger and chagrin were boundless when he learned of the outcome of the affair, and he informed his men that, if they could not whip Roosevelt's cowboys, he could whip their boss, and that some day he would go to Roosevelt's ranch and keep his word. Roosevelt heard of this threat and at once sent word to De Mores that he need not take the trouble to come to his ranch, that he would meet him halfway wherever he wished and settle the difficulty in any way he preferred. Marquis De Mores failed to

respond to this challenge, and the impression became general in that section of the country that the Frenchman's hand had been "called", to use a card-game phrase, and that he had been found bluffing.

The Cattle Industry Like All Others a Great Success When Backed By Brains and Work.

A man who was "game" was one sure to be respected and admired by the westerner of that day, and the De Mores episode gained for Roosevelt no small reputation; while, despite adverse opinion, his cattle industry proved to be a financial success. The cattle wintered well in the "bad lands", and he shipped East some of the finest beeves ever placed in the Chicago market. After some three years of this life he found himself the owner of several thousand herd of cattle, with all the necessary appurtenances of the business, and could, no doubt, have remained in the business and become one of the cattle kings of the West. But by that time he had obtained what he went West for—vigorous health and an iron constitution had come to him, and he was ready for greater things. He had given the people of the West an example of firm integrity and forceful character, early winning their esteem and loyalty. This has since extended widely among all the people of the country by the continued exercise of the sturdy independence which he displayed among a class of people whose pluck and perseverance in the upbuilding of a great new country has been immortalized in song and legend.

The incidents of Roosevelt's life here described are among those least known to the people at large. His political, legislative, official, and military life is as well known to most of us as the events of our own careers, and it need but be said, in conclusion, that the qualities which he displayed in the hunting field and on the ranch of the far West are the same as those that have carried him to the Presidency of the United States. His vigorous and clean cut expressions in all he says and writes do credit to his ideals.

Wise Sayings of Theodore Roosevelt.

"It is a good thing for all people to keep steadfastly in mind the fact that no matter how humble a man's origin has been, if he can show himself a man, he is to be treated as such."

"If a man cannot get an education, and in spite of being unable to get it, works his way up—honor to him, double honor to him; but remember that, other things being equal, it is safer to trust the man who will get an education."

"We do not want the people to accept as an ideal the man with a consumptive cough who cannot run a mile at speed."

"You ought to have bodily strength to go with your mental strength; it is not so important, but it is important. And there is something more important than either, more important than body; and that is character."

"Intellect is a good thing, but character is an infinitely better thing, for character is essential."

"You must cultivate the strong, vigorous, virile virtues no less than the virtues of sweetness and of charity, and the graces of refinement and cultivation."

"If you possess character you have got to be honest. You have got to be more than that, you have got to be brave. You have got to show moral courage, and at need physical courage."

"You must use aright the talents that have been entrusted to you, the talents that you have been able to put into such shape that you can use them, through the education you have had."

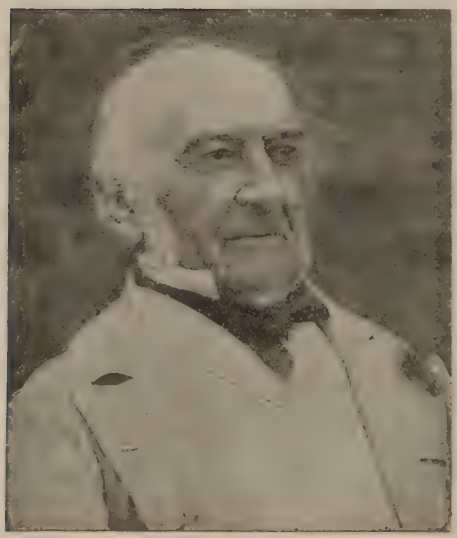
"Work to help your brother who is less fortunate than you are, and remember that at some time or another, every one of us, man and woman, no matter how strong and self-confident, will need a helping hand."

"Remember that the only way that you can permanently help anyone is to help him to help himself."

"Test your theories by practice so as to be sure they are right before you advocate their being put into practice by others."

PERSISTENT, UNYIELDING EFFORT MADE GLADSTONE ENGLAND'S PRIME MINISTER

GREAT ABILITY AS WELL AS MODERATE ABILITY MUST BE EMPLOYED TO ITS FULL CAPACITY



"Be diligent in business."—*William Ewart Gladstone.*

Gladstone once said of Cobden, for whom he felt the deepest respect, "I do not know that there is in any period a man whose public career and life were nobler or more admirable. Of course, I except Washington. Washington, to my mind, is the purest figure in history."

An American cannot but feel gratified by this well-deserved eulogy of Washington, but Gladstone himself may with all justice be added to his two paragons of nobility of character, to form a trio unsurpassed in purity of devotion to what they deemed the best interests of their country. William Ewart Gladstone was not a thick-skinned devotee of party. His mind developed and his opinions changed as his body grew. He began his political career as a firm Conservative and ended as the leading Liberal of Great Britain. He showed his tendency of mind in his first political speech, made while he was still a student at Oxford. This must have been a wonderful effort, for Bishop Wordsworth predicted, after hearing it, that the speaker "would one day rise to be Prime Minister of England." It was a conservative speech, one that vigorously assailed the Reform Bill of 1831, but Archdeacon Denison, who also heard it, said: "I have just heard the best speech I ever heard in my life, by Gladstone, against the Reform Bill. But, mark my words, that man will one day be a Liberal, for he argues against the bill on Liberal grounds." It is remarkable that the maiden political speech of a college student should have led to two such predictions, both of which came true.

Nobility of Character Obtained at School and at Home a Good Asset.

A man with the wonderful oratorical powers of Gladstone, was sure to find his way soon into Parliament, and sure to rise there. Serving there as representative for the great Tory University of Oxford, it became difficult to break away from Conservative fetters, but his innate Liberalism developed till in 1865, Oxford discarded him as its member. At once he offered himself,

saying in his opening speech at Manchester: "At last, my friends, I am come among you; to use an expression which has become very famous and is not likely to be forgotten, 'I am come among you unmuzzled.'"

It was, no doubt, to his grand oratory that much of his great success as a statesman was due, though much of it was also due to his nobility of character. There was no one of his time equal to him in swaying and convincing an audience. His rich and musical voice, his animated gestures, his impressive delivery, fluency of language, and precision of statement gave him an extraordinary influence over his hearers. His sentences, indeed, were long and involved, but his fine choice of words, rich rhetoric, deep earnestness, impassioned delivery and intense conviction of the truth of what he said carried away on the flood of his eloquence all who heard him.

But it was not alone to oratory that Gladstone owed his influence. His honesty and moral elevation were as marked as his eloquence. His deep humanism, his intense feeling for the poor and oppressed of all lands, his disregard of all political considerations when cruelty and oppression roused his indignation endeared him to the noble-minded wherever they dwelt, and won him the respect and admiration of all who felt the sentiment of the brotherhood of man. Nothing could keep him from speaking his mind when cruelty aroused him.

A True Man Sympathizes with the Oppressed Everywhere.

He spent part of 1850 and 1851 in Naples, and witnessed there the shameful inhumanity of King Ferdinand, in whose dungeons were more than twenty thousand political prisoners whose prison life was a continual torture. Never was there a greater torrent of denunciation than Gladstone poured upon "King Bomba's" head. Europe rang with it. His letters vibrated with the most intense indignation against that "Negation of God erected into a system of government."

"The prisons of Naples, as is well known, are another name for the extreme of filth and horror," he said: "I have seen the official doctors not going to the sick prisoners, but the sick prisoners, men almost with death on their faces, toiling upstairs to them at that charnel-house of the Vicaria, because the lower regions of such a palace of darkness are too foul and loathsome to allow it to be expected that professional men should consent to earn bread by entering them."

The vehemence of his letters was such that all Europe was awakened and England was stirred to its depths, while they did much in rousing Italy to that patriotic fervor which in the end led to liberty. Gladstone became one of the heroes of the freed people. Later, in 1876, his trumpet blast of indignation again rang through Europe, this time awakened by the "Bulgarian Horrors," the frightful inhumanity of the Turks in Bulgaria. "Let the Turks carry away their abuses in the only possible manner—by carrying off themselves," he wrote. "Their Zaptiehs and their Medies, their Bimbashis and their Yusbadis, their Kaimakams and their Pashas, one and all, bag and baggage, shall, I hope, clear out from the province they have desolated and profaned."

That is the true Gladstone,—not always correct, not always intellectually superior, but always morally right, and his nobility of soul gave him a strength in the world which the powers of his mind, even backed up by his matchless oratory, might have failed to gain.

We have no need to say much about Gladstone's career. It was very largely a parliamentary one, in which he waged for many years a pitched battle against his powerful opponent, Benjamin Disraeli. From 1852 to Disraeli's death in 1881, this fight went on, now one, now the other, being at the head of the Government. In 1853, he succeeded Disraeli as Chancellor of the Exchequer, and the British Parliament had never heard such a speech on finance as that of his. The members were as charmed with his handling of this dry subject as if they had been listening to a fairy tale. In 1868 Disraeli rose to the exalted office of Prime Minister, and before the year was out Gladstone succeeded him in this also. At this time Bishop Wilberforce wrote in his journal:

"Gladstone as ever great, earnest, and honest; as unlike the tricky Disraeli as possible. He is so delightfully true, and the same; just as full of interest in every good thing of every kind."

A marked contrast, indeed, were the two men; Gladstone the symbol of outspoken honesty, Disraeli the type of political expediency; the one transparently open, the other crafty and hidden; the one rising to the head when the public sentiment of England was on the side of honor and justice; the other when lower considerations prevailed. Gladstone had opposed the Reform Bill of 1831. He was the heart of the Reform Bill of 1866, which gave the right to vote to millions of Englishmen. He carried many other bills in the interest of reform and the rights of man, the greatest triumph of his life being when he posed before England as the "Grand Old Man" and, when in his eighty-fourth year, he carried through the House his bill for Home Rule in Ireland, which had been the unceasing purpose of his life for the preceding six years. He retired from public life soon after this signal victory, declining the peerage which the queen offered him. His own name was title of nobility enough.

Decline Great Honors when they are a Hindrance to Your Usefulness.

Gladstone's success was due as much to persistent, unyielding effort as to ability. He was a worker all his life. The word rest was not to be found in his lexicon. When not engaged in politics, he busied himself with literature. The study of Homer was one of his delights, and the source of several works and a number of papers from his pen. These, it must be said, showed more industry than critical discrimination, and the same may be said of his various other literary labors. They display no superior intellectual powers or graces of style and his attempts at literature exposed the weak side of Mr. Gladstone's mind. He was a born orator, a moralist of the highest rank, but not a profound thinker or capable critic.

The extent of Mr. Gladstone's daily intellectual labors has been a matter of very general surprise. That which he accomplished was, indeed, only possible under strict rule and method. From his earliest years of study each day had seen fulfilled its due share of work. At Oxford, he was an exception to undergraduate life, and "did not break off his morning studies at the regulation luncheon hour of one o'clock. It mattered not where he was, in college rooms or in country mansion; from 10 A.M. to 2 P.M. no one ever saw William Ewart Gladstone. He was locked up with his books."

Methodical Work Accomplishes far More than Unplanned Work.

"From the age of eighteen to the age of twenty-one he never missed these precious four hours except when he was traveling. And his ordeal in the evening was not less severe. Eight o'clock saw him once more engaged in a stiff bout with Aristotle, or plunged deep in the text of Thucydides." The habit of assimilating knowledge was constant with him, in all places and at all seasons, from the first day of his college life. He was always an early man. "Shortly after eight o'clock in the morning he walked down to prayers in the village church. Early devotion and breakfast over, the remainder of the morning, till the gong sounded at two o'clock, was devoted to work—to reading, writing, meditation, or to the performance of arithmetical feats which no Cabinet Minister has ever surpassed. Luncheon over, there was more reading; or, if there be visitors in the house, pleasant gossip; or, if the weather be tempting, long walks to be taken, or tough oaks to be hewn. Loving air and exercise, Mr. Gladstone was a singularly temperate man in meat and drink. Still he was only abstemious, not ascetic."

Another way of taking rest from political labors was that of wielding the axe in cutting down the giants of his groves. Sawing wood has long been known as an excellent exercise, but it is dull work compared with the pleasure of striking at a huge tree. Yet most men would scarcely call this recreation, and only a man of stalwart make in mind and body would select it as an agreeable exercise. Gladstone was, in truth, a *large* man in almost every repect, and when he died England suffered a loss not easily to be made good.

An Oboe Player Becomes a Great Astronomer.

PLENTY OF ROOM AT THE TOP EVEN AT STAR GAZING. A NEW PLANET DISCOVERED MAKES HERSCHEL RENOWNED

Everybody has heard of the Herschels, father and son, who won success in science and became the most famous of astronomers. But everybody does not know how William Herschel the musician, rose to be Sir William Herschel, Astronomer-Royal of England. His story is a good illustration of what the pursuit of an idea by a capable man will do.

His father was a poor German musician, who brought up his four sons to the same calling. William came over to England to seek his fortune, and he joined the band of the Durham Militia, in which he played the oboe. The regiment was lying at Doncaster, where Dr. Miller first became acquainted with Herschel, having heard him perform a solo on the violin in a surprising manner. The Doctor entered into conversation with the youth, and was so pleased with him, that he urged him to leave the militia band and take up his residence at his house for a time. Herschel did so, and while at Doncaster was principally occupied in violin-playing at concerts, availing himself of the advantages of Dr. Miller's library to study in his leisure hours.

Music Leads to the Study of Mathematics.

A new organ having been built for the parish church of Halifax, an organist was advertised for, upon which Herschel applied for the office, and was selected. While officiating as organist and music-teacher at Halifax, he began to study mathematics, unassisted by any master. Leading the wandering life of an artist, he was next attracted to Bath, where he played in the Pump-room band, and also officiated as organist in the Octagon chapel.

The Knowledge of Mathematics Leads from Music to Astronomy.

Some recent discoveries in astronomy having arrested his mind, and awakened in him a powerful spirit of curiosity, he sought and obtained from a friend the loan of a two-foot telescope. So fascinated was the poor musician by the science, that he even thought of purchasing a telescope, but the price asked by the London optician was so alarming that he determined to make one. Those who know what a reflecting telescope

is, and the skill which is required to prepare the concave metallic speculum, which forms the most important part of the apparatus, will be able to form some idea of the difficulty of this undertaking. Nevertheless, Herschel succeeded, after long and painful labor, in completing a five-foot reflector, with which he had the gratification of observing the rings and satellites of Saturn. Not satisfied with this triumph, he proceeded to make other instruments in succession, of seven, ten and even twenty feet. In constructing the seven-foot reflector, he finished no fewer than two hundred specula before he produced one that would bear any power that was applied to it,—a striking instance of the persevering laboriousness of the man.

Sisters May Help Their Brothers in Their Struggles for Greatness.

As a glimpse into his daily life it is pleasing to note that he had a favorite sister Caroline, who had implicit faith in his ability and confidence in his success. She also won a reputation for astronomical researches, and was a great help to him. It is said that with a small telescope she discovered seven comets and wrote many papers which were read and contributed to the astronomical society which recognized her ability by presenting her with a gold medal, and also elected her an honorary member of the society.

When her brother found himself in easy circumstances he brought her to Bath to reside with him. She thus describes his life soon after their arrival at this place: "He used to retire to bed with a basin of milk or a basin of water, with 'Smith's Harmonics' or 'Ferguson's Astronomy' under his arm, and so went to sleep, buried under his favorite authors, and his first thoughts on awakening were how to obtain instructions for viewing those objects himself of which he had been reading."

Make the Best Use of Resources You Have at Hand Before Expecting to Find Better.

At first he had to content himself with hiring a small Gregorian reflector of about two inches aperture, which he had seen exposed for loan in a tradesman's shop. It was entirely beyond his means to think of purchasing an instrument for his own use. Not being satisfied with the instrument he had hired, he procured a small lens of about 18 feet focal length so as to make him a telescope. The tube made in this way naturally bent, and it was of no use for astronomical purposes, but for the determined eyes of William Herschel. The pasteboard was soon displaced by tin, and so a poor sort of vision was obtained of Jupiter, Saturn and the moon. The great reflecting telescope made by his own hands was a wonderful instrument for the period, as was evident when he saw as no others had seen, Saturn, that great globe, with its magnificent rings and six of its moons, in a splendor now commonly known. One of these moons was seen by him for the first time and he soon discovered another, thus adding two moons to Saturn's shining family.

How a New Planet was Discovered and Named.

While sublimely gauging the heavens with his instruments, he continued patiently to earn his bread by piping to the fashionable frequenters of the Bath Pump-room. So eager was he in his astronomical observations, that he would steal away from the room during an interval of the performance, give a little turn to his telescope, and contentedly return to his oboe. Thus working away, Herschel discovered a new planet, the Georgium Sidus, now named Uranus, the orbit and rate of motion of which he carefully calculated, and sent the results to the Royal Society; when the humble oboe player found himself at once elevated from obscurity to fame. He was shortly after appointed Astronomer Royal, and by the kindness of George III. was placed in a position of honorable competency for life. He was given a salary of 200 pounds, or about $1,000, and his friend in speaking of it, says, "Never before was honour purchased by monarch at so cheap a rate." He made other important discoveries, as did his son, Sir John Herschel, who also won fame as an astronomer.

ACKSMITH.
BLACKSMITH~
SCHOOL TEACHER~
POET
"Set your face to the stars and press on in the Now; Reck not of the Future; reck not of the past: They are God's."
-Edwin Markham
Tom Booth '02

EXAMPLES OF SUCCESS ARE FOUND IN LITERARY WORK. THE SAME QUALITIES REQUIRED EVERYWHERE

Success finds its heroes in every field, alike among the workers and the thinkers, the men who keep the world in motion and the men who tell the story of effort and achievement. It is fitting that we should present the record of one of the latter, and we cannot think of a better example of phenomenal success as a writer than the author of the "Man with the Hoe."

Doing Chores on the Farm and Walking Five Miles to School as Many Boys do.

It is doubtful if any poet before him cultivated the muse in such soil as that which fell to Edwin Markham's lot. He lived as a child on a ranch in a Californian valley, where his efforts to gain an education had in them much of the pathetic. In order to attend the sorry little school which lay five miles from his home, he had to be up at three o'clock in the morning, to chop wood, milk and feed the cows, bring water from the well, and do other chores. Then he would set out afoot on his five miles walk. Only on days of state or ceremony would he be permitted to ride—and only then when his strong-minded donkey consented to carry a boy of his light weight.

The school was kept only three months in the year and its teachers were of the wandering kind, under whom none but a very studious boy could hope to make much progress. Young Markham was eager to learn and became a favorite pupil of two of his teachers.

A Growing Healthy Boy Need Not Fear the Experience of Hard Work.

As he grew older he entered more fully into the active labors of ranch life. He was promoted from the donkey to the horse and became a daring rider, few of the cowboys of the valley surpassing him in skill in rounding up or lassoing cattle. His rides after stray steers would sometimes take him twenty miles from home, when, as night came on, he would have to unsaddle, stake his horse, and camp out with a blanket for covering, often, perhaps, to wake with the rain beating on his face. This was a splendid experience for the growing boy. There was poetry for him in those wild dashes over plain and hill and in his occasional adventures with wild animals or cattle-thieves. The story of his wild life in these years of growth we have from Markham himself, and it was a life

full of stirring scenes, and, doubtless, ripe with poetic inspiration to a youth of his thoughtful mind. He had some experience too at the forge in a blacksmith shop, but this incident is not dwelt upon as it was an occupation he followed for a short time and it was one which did not appeal to his imagination or taste.

As manhood approached his growing desire for education was partly satisfied by a course in the State Normal School at San José, California, which was followed by a college training in the classics and higher mathematics. But his deep-revolving intellect had led him into views of life duty resembling those of Tolstoi. He was strongly impressed with the dignity of manual labor and earnestly deprecated the tendency he saw among educated men to shirk all kinds of severe handiwork. Though trained for a teacher, he determined to fit himself for what appealed to him as one of the normal duties of life, and entered upon the study of the ancient art of the blacksmith, in a wayside shop on the road to Santa Clara. Here he remained till he felt himself to be a master of the art, and then set out to practice his chosen vocation as a teacher.

The story of his first experience is not without its humor. Appointed to take charge of a school in Arroyo Grande, a little mountain town three hundred miles from his home, he staged this distance only to find that no school-house had been built, and that he was decidedly left out-of-doors. He was then twenty-two years of age, tall, strong, and full of grit. His life had been an out-door one, and he felt that he could stand it, if the pupils could. Selecting the well-shaded space round the trunk of an ancient oak for his college hall, he put his table-desk beside the trunk, nailed up a rough blackboard above it, built out of old boxes and planks the seats and desks for the children, and was ready to begin work in "The Oak Tree College." Around it he put up a rough hedge fence to keep wandering cows out of his college hall at night. In this way Markham's career as a teacher began. As the State grew in population and he advanced in years and experience he was called to higher duties. He proved an able and successful teacher, and in time rose to the superintendency of some of the most important educational institutions of the State.

High Thinking Should Accompany all Business and Professional Activity

This was very well in its way. Edwin Markham was doing his duty in the world, yet if this had been all his name would never have been heard beyond the borders of his native state. But while teaching he was thinking. His early love for poetry was ripening and bearing fruit in his mind. Poems from his pen began to appear in the pages of the magazines. They were all of grave and thoughtful tendency, indicating a man who had brooded long and deeply upon the unequal conditions of mankind, the bitter suffering to which this had often led, the cruel selfishness which wealth often engenders in the rich, and the unnatural character and injustice of it all.

One theme above all others dwelt in his deep-revolving mind. He had seen Millet's picture of "The Man with the Hoe," and the utter and unrelieved degradation to which stress of labor seemed to have reduced this "brother to the ox" wrought powerfully in the poet's mind, waking all that sympathy for the martyrs of civilization which had long been growing in his soul. For ten long years he brooded over this theme, seeking to put into poetry all its deep significance to him. Then he launched upon the world his poem of "The Man with the Hoe," of few lines, but so full of thought, so vitalized with indignation, that it swept through the world like a blast of fire from the depths of a volcanic soul. Never had such a concentrated expression of one of the greatest problems of the age been given to mankind, and Edwin Markham grew famous in a breath.

The "Man with the Hoe" will probably live as one of the world's great poems, even though the author never again attains to its height. It was a great success, for in it the thought of a life of earnest reflection upon the deepest themes of life and destiny was melted and poured out red-hot, to burn its way like a revelation into the world's mind.

FROM THE PUSH CART TO THE CABINET

THE PRINCE OF MERCHANTS RUNS TO WEALTH AND HONOR BY FAIR DEALING

"If anything purchased in my store is not exactly as represented please return it and your money will be refunded.
—*John Wanamaker.*

Organization is the great principle in modern trade. It is not a new principle, but it is new in its vast expansion. And one of the first to apply it to the retail business was the famous merchant, John Wanamaker. We can best express his ambition as a business man, his aspirations, and his ability as an organizer in the words of his early employer, Colonel Joseph Bennett, who said of him,—"John was certainly the most ambitious boy I ever saw. I used to take him to lunch with me, and he used to tell me how he was going to be a great merchant. He was very much interested in a temperance cause, and he had not been with me long before he persuaded most of the employees in the store to join the temperance society to which he belonged. He was always organizing something. He seemed to be a natural-born organizer. This faculty is largely accountable for his great success in after life."

John Wanamaker, like so many who become men of great wealth and business interests, began with no capital in cash and scarcely any in education. So poor was his school training that, though he seems to have enjoyed the first sermon he ever heard, he must have done so on faith, for it was full of words he did not understand. These he wrote down and looked them up in the dictionary—an early instance of his love of thoroughness.

Turning Bricks in the Brickyard is Hard Work But Many a Man Has Started There.

He had little time to study, for he early began the business of his life, the making of money. As a little toddler he was put to turning over the bricks in his father's brickyard, that they might dry in the sun—his first earnings being large in bulk though small in sum, seven of the huge old copper cents. As he grew older his work grew harder, but when he was fourteen his father died, and he at once abandoned the brickyard for a more congenial employment, entering a bookstore on Market Street, Philadelphia, at a salary of $1.25 per week. The store was four miles from his home, so that he had to walk eight miles a day, his only spending being for a cheap luncheon. An offer of twenty-five cents a week more wages soon led him to Colonel Bennett's clothing store. When he was eighteen he was receiving there six dollars a week, and probably felt quite rich.

The boy was not only devoted to temperance, but to religion, to whose services

he gave many of his spare hours. He was an ardent member of the Young Men's Christian Association, perhaps without business views, for he showed such activity in promoting its work that the Philadelphia Branch elected him for its first salaried secretary, at a salary of $1,000 per year. He earned his salary during his seven years of service by enrolling more new members than has ever been done since in the same space of time.

Investing First Profits in One's Own Business is Always Good Policy.

The young man was getting his mercantile education. At twenty-four he began to apply it, engaging in the clothing business with his brother-in-law, Nathan Brown, at the corner of Sixth and Market Streets. The total capital of the new firm was $3,500. Their stock in trade was necessarily a very modest one, and as they could not afford a horse and wagon, the ambitious young merchant followed the example of Benjamin Franklin and himself delivered in a push-cart the first goods sold. But his business enterprise showed itself at the start, the profits of the first day's trade—thirty-six dollars—being expended in a newspaper advertisement the next morning. From that day to this John Wanamaker has been a Napoleon in advertising, his competitors watching his daring enterprise with awe and admiration, and following him at a respectful distance.

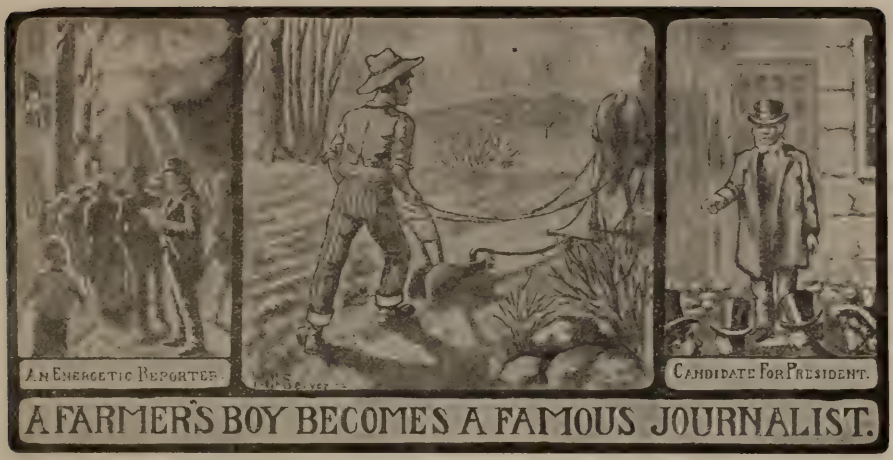
From the beginning his business prospered. The public were kept daily aware of its existence, and the bargains which it had to offer. He established the one-price system—an innovation in that line of trade—and his faculty for organization displayed itself in every corner of his establishment. The department store was created by him. In ten years' time he had become the leading clothing merchant of Philadelphia, and four years later purchased the freight depot of the Pennsylvania Railroad Company, at Thirteenth and Market Streets, for $450,000. Since then, as he may have foreseen, the stations of the two great railroad systems of the city have been built within a few hundred feet of his store, which has become the centre of Philadelphia's retail trade.

Organization and Bold Advertising, His Business Watchwords.

The new establishment was made the first fully-developed example of the department store, while taste and skill in the arrangement of goods was so developed that Wanamaker's came to be looked upon as a permanent fair, and to "see Wanamaker's" became one of the expected pleasures of a visit to Philadelphia. Since that day, the "Grand Depot" has spread over double its original space, a branch establishment has been opened in Paris, and the Stewart store in New York purchased and a new Wanamaker's founded there. The New York shopper takes to this as kindly as the Philadelphia shopper had long done.

John Wanamaker's success has in it another element, the faculty of recognizing and appreciating a capable man and paying him handsomely for his services. His decorators, his advertisers, his leaders in every branch receive larger salaries than are paid to Cabinet ministers—and earn them, too. Wanamaker's genius for organizing was too active to be confined to his store. The enthusiasm for religious progress, first displayed in the Young Men's Christian Association, was afterwards shown in his Bethany Sunday-school, which grew and grew until it had far outgrown in dimensions any similar enterprise in his native city. In 1889, his reputation as a great merchant brought him the honor of an appointment to the position of Postmaster-General in President Harrison's cabinet. This was, in a sense, a business position, and he introduced into it business methods to an extent which greatly improved the postal service of the country.

To-day, the business of the Wanamaker establishments in Philadelphia alone is between $30,000,000 and $40,000,000 yearly. In the Grand Depot, as the Thirteenth Street store is often designated, the system of profit-sharing has been introduced, the share of the annual profits coming to the employees at the end of the first year amounting to $109,439.68. There has rarely been an example of finer executive capacity than that displayed throughout John Wanamaker's career, and it has brought what such a capacity could not fail to bring, success.



A FARMER'S BOY BECOMES A FAMOUS JOURNALIST.

HORACE GREELEY WAS AN EMINENT EXAMPLE THAT ABILITY AND INTEGRITY ARE ELEMENTS OF SUCCESS.

"I would rather be a slave in a rice swamp than to pass through life under the harrow of debt."—*Horace Greeley.*

For many years one of the most notable figures in New York was that of Horace Greeley. Awkward in manner, careless in dress, with an unpleasant tone of voice and an unimpressive aspect, he was nevertheless acknowledged as one of the leaders of thought and a power in the nation from Maine to Oregon. He made his way by force of intellect and integrity from the position of a poor country boy to that of the chosen candidate for President by the Democratic party—a party of which he had long been the most influential opponent. The story of a man like this, and of the steps by which he achieved success, is worth telling, even though we must tell it in brief outline.

Many a Good and Great Man Began Life With hard Work.

Horace Greeley began life with hard work. His father was an itinerant farmer, who moved from New Hampshire to Vermont and thence to the wilds of western Pennsylvania in search of the means of life. There, in a log cabin in a new clearing, the family sought a livelihood, and Horace, who had learned the printer's art in Vermont, set out in search of work to help keep the wolf of want from the door. He was a tall, ungainly lad, whose peculiar looks, his piping, whining voice, and his mean and shabby clothes at first brought him ridicule instead of employment. But those who talked with him soon found that they had a thinker to deal with. While the boy had worked hard, he had also read diligently. Nothing could keep him from books; he read constantly and intelligently and what he read he remembered. In politics particularly he was well informed, with decided opinions and a very able manner of expressing them.

Working for a few months on the *Erie Gazette*, and sending home nearly all his earnings, he set out with fifteen dollars in

his pocket for New York, six hundred miles away. Traveling partly by canal and partly on foot, with the small outlay of about five dollars, he found himself one summer's day in 1831 in the then small but hustling city, without a friend or a job and with only ten dollars between him and stavration.

Do Not be Rebuffed if a Place is not Found at the First Attempt.

Finding the cheapest sort of a boarding place, he sought day after day for work, but his very uninviting appearance and his lack of persistence when refused stood in his way, and a week of search passed by without a moment of hope. But his landlord grew to like him, spoke to his friends about him, and hearing of a place where printers were wanted, told him. On Monday morning, bright and early, Horace was on the spot. The place was not yet open, and one of the first workmen who came up began talking with him. This man, like himself, had learned his trade in Vermont, and, finding that he seemed as honest as he was ungainly, spoke a good word for him with the foreman. The latter, not very hopefully, gave the lad a chance, putting him to work on an edition of the polyglot Testament. It was a difficult job, but the new hand worked all day silently and earnestly, and when the foreman at night saw a printer's proof of his work, it proved to be longer and more correct than that of any other hand in the shop. The battle was won. Horace had gained his footing in New York.

Avoid Debt, Live on Less and be Happier

It was the period in which the cheap newspaper was being established, and the newcomer was more enterprising than his looks gave warrant for. We soon find him joining Francis Story in founding the *Morning Post*, the first daily penny paper ever published. It was very able but proved of short life. The next year, 1834, forming the firm of Greeley & Co., he founded the *New Yorker*, a weekly literary paper, and the best of its kind in the country at that time. It failed in 1841 owing Mr. Greeley $10.000 for editorial work; but he was much less concerned about this than about what it owed others. His feelings about debt were strong. "For my own part," he said, "and I speak from sad experience, I would rather be a convict in a states prison, a slave in a rice swamp, than to pass through life under the harrow of debt. If you have but fifty cents and can get no more for a week, buy a peck of corn, parch it, and live on it, rather than owe any man a dollar."

About this time James Gordon Bennett was thinking of starting the *Herald*, and Greeley, whose cleverness in journalism was then evident, was asked to join him. He inquired how much money was in hand. "Five hundred dollars," was the reply. "It isn't enough," he replied. "I will not go with you, for I do not think you will succeed." The energetic Bennett soon disproved this pessimistic opinion, and Greeley, eager to rival him in his success and to become the head of a great daily, six years afterward launched the *Tribune* in the world, an infant enterprise that was destined to a great career.

The Founding of a Great New York Daily Paper to be the Champion of the Poor.

The story of Horace Greeley's business life after that is the story of the *Tribune*. He made it a power in the world. The strength of the *Herald* was as a purveyor of news; that of the *Tribune* was as a molder of public opinion. Mr. Greeley associated with him the ablest writers upon whom he could lay hands, and the views of the *Tribune* on books, art, the drama, and all learned subjects became the opinions of thousands of its readers. It also became favorably known for its intelligent support of all movements of reform and philanthropy. The toiling poor found in it a persistent champion; whatever seemed for the best good of mankind won its warm advocacy; and the moral tone of the community was distinctly advanced by its efforts. Greeley's own pen, however, was especially powerful in politics, to which he had given years of thought and study, and his trenchant editorials on this subject have

never been surpassed for strength and insight. His political influence was immense. Thousands of men accepted all he said as gospel. William D. Howells tells us that when in his boyhood days, the neighbors gathered around the country store when the *Tribune* was received, and as it was opened, were apt to say: "Well, let us see what old Greeley says this week," and what they heard they rarely questioned.

His political sentiments were those of the Whig party. When this died out and the Republican party was formed, its existence was largely due to the *Tribune*, which has never ceased to support it. Temperance, women's rights, the abolition of capital punishment, and opposition to slavery were among its favorite subjects of support. When the Southern States voted for secession the *Tribune* advocated letting them go, but when Fort Sumter was fired on its tune changed and it became a powerful supporter of President Lincoln and the Union. Greeley, indeed, became a more ardent war-advocate than the administration relished. He insisted that battles must be fought and the Confederacy overthrown without delay. "On to Richmond" was the *Tribune's* war-cry, and many blamed Greeley after the defeat of Bull Run, attributing it to his policy of haste. He annoyed Lincoln also by his demands for immediate emancipation, for more vigorous war measures, for peace movements, and for other things which those at the helm of state knew to be inadvisable, if not impossible. His eagerness, in this way, often ran ahead of his discretion, and at times the authorities at Washington were sorely tried by their too persistent and too influential friend.

Great Political Influence May be Wielded by a Private Citizen.

Greeley's editorial career, aside from such evidences of newspaper statesmanship as those mentioned, was most distinctly a success, and the journal which he built up still ranks among the most influential in the land. His political career was as distinctly a failure. Seward became one of his pet enemies, and he rejoiced in the nomination of Lincoln chiefly on account of the defeat of Seward. Seward's appointment as Secretary of State he viewed as a personal offence, and he opposed Lincoln's second nomination on the ground of his slow emancipation policy. In 1868 Grant was not the man of his choice, but he was forced to bow to the force of public opinion. He supported Grant heartily in the campaign, expecting to be rewarded by an appointment as Minister to England. But he was not a suitable man for that position, and his friends did not even mention the subject to President Grant. Greeley's desire for official position reached its culminating point in 1872, when he opposed Grant's renomination so strongly that he was taken up as the candidate of the bolting Republicans and received the nomination of the Democrats, whom he had been assailing for thirty years.

His acceptance was suicidal. He was strongly hopeful, but he had offended his Republican friends, he could not fairly expect cordial support from his life-long enemies, and his overwhelming defeat was what many had predicted. It was fatal to him. The cruel impeachment of his integrity by his friends was a greater shock than the overthrow of his aspirations. He drooped, and in a few weeks died, leaving behind him the reputation of one of the ablest and noblest journalists the country had ever known.

In his death his acts of weakness were forgotten; his acts of greatness and nobility of mind were alone remembered.

Greely's Good Advice.

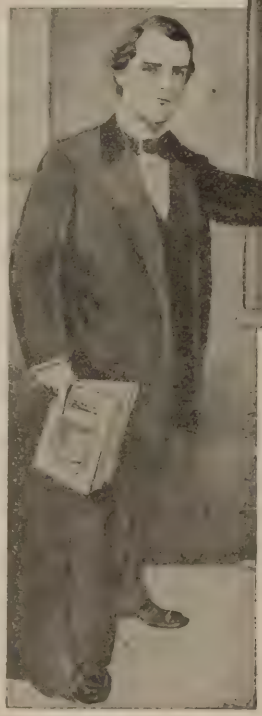
"Half the young men in the country, with many old enough to know better, would 'go into business'—that is, into debt—to-morrow, if they could."

"Most poor men are so ignorant as to envy the merchant or manufacturer whose life is an incessant struggle with pecuniary difficulties, who is driven to constant 'shinning,' and who, from month to month, barely evades that insolvency which sooner or later overtakes most men in business; so that it has been computed that but one in twenty of them achieve a pecuniary success."

THE HEAD OF THE COUNTRY SCHOOL BECOMES THE HEAD OF THE NATION

SCHOOLMASTER, SOLDIER, STATESMAN, PRESIDENT AND MARTYR

"Good in his greatness and great in his goodness" was the estimate which William McKinley made of President Hayes. It applies even better to himself. He may also justly be called "one of the people," since, like so many of our Presidents, he rose from the ranks, and to the end was simple, unpretentious, and kept himself on a level with his fellow-citizens. There are few in our country who are not familiar with the life of our late President, so we will not repeat it, but confine ourselves to some significant episodes in his career.



"Duty determines destiny."
William McKinley.

McKinley was born neither to poverty nor wealth. His parents, who dwelt in the little town of Niles, Ohio, were well-to-do people, and the boy had all reasonable advantages of play-time and school-life, finishing his education in Alleghany College, Pennsylvania, which he entered at the age of sixteen. He was a true boy, fond of fishing, skating, and boyish sports in general, with no visible Presidential possibilities in his demeanor.

"He Kept on Fishing," and Left His Comrades Far in the Rear.

One of his playmates and young friends says, "Little did I suppose, as I sat fishing with him on Mosquito Creek, with our legs dangling from the edge of the bridge, or as we caught angle-worms to bait our hooks, that I was with a coming President. I well remember his patience with the hook and line. The rest of the boys would get disgusted at not getting a bite and go in bathing, but 'Bill' would keep on fishing."

There is suggestiveness in this phrase. It was by his tendency to "keep on fishing" while others were playing, that the young fisherman left his comrades so far behind in the race of life. The boy was not precocious. There are no tales of any startling progress in school. But he was observant, thoughtful and earnest, and as he grew older showed an inclination to argument and oratory, being prominent in all schoolboy debates. He was bright enough to skip the Freshman year in college, and enter as a Junior. On leaving, as his father was feeling the pressure of the hard times, he took a position at school-teaching, in a district-school near Poland, where the family then lived. He got $25 a month salary and "boarded around" Probably he did not relish this, for much of the time he lived at home, walking several miles to school and back. That was the position of young McKinley in the spring of 1861, when war broke out. Fired with patriotic ardor, he at once dropped book, pencil and rod, and enlisted in the village company, a soldier of eighteen.

The Commissary Sergeant Wins Promotion by Coolness and Daring.

Of McKinley's life as a soldier we have but one incident to tell. It was an incident that showed he had the true stuff of a soldier in him. During the fury of the fighting at Antietam he, as commissary sergeant of the regiment, was at the base of supplies. Here he signalized himself by an act of striking coolness and daring. In every battle the commissary supplies are a centre of attraction for those stragglers whose faint hearts lead them to shirk their duty in the ranks. McKinley, thinking that the men who had borne the brunt of the fray must be in a state of exhaustion, conceived the idea of going to their relief. He set some of the stragglers to making coffee. Loading up a couple of wagons with the hot beverage, he set out with his mule teams for the line of battle. We can best finish this story in the words of one who was present:

"It was nearly dark when we heard tremendous cheering from the left of our regiment. As we had been having heavy fighting right up to this time, our division commander, General Scammon, sent me to find out the cause, which I very soon found to be cheers for McKinley and his hot coffee. You can readily imagine the rousing welcome he received from both officers and men. When you consider the fact of his leaving his post of security and driving into the middle of a bloody battle with a team of mules, it needs no words of mine to show the character and determination of McKinley, a boy of, at this time, not twenty years of age. McKinley loaded up two wagons with supplies, but the mules of one wagon were disabled. He was ordered back time and again, but he pushed right up."

This daring deed brought him promotion from sergeant to lieutenant. He left the army on July 26, 1865, with the brevet rank of Major, at the age of twenty-two.

In Law and Business You Must "Keep at it."

From that time forward McKinley "kept on fishing." He studied law, and in 1867 began practice at Canton, Ohio, his legal place of residence for the remainder of his life. An ardent Republican in political opinion, he soon showed himself an able orator, and in 1876 was sent to Congress, Rutherford B. Hayes, who had been the first major of his regiment, being still over him as President. The great event of McKinley's Congressional career came in 1890. From the start, a vigorous advocate of a protective tariff, in that year he succeeded in carrying a tariff bill practically made by himself, and long known to the nation as the "McKinley Tariff." We have but one thing more to say in regard to his career in Congress, a thing which showed the kind of man he was. In one election his majority fell off, and Mr. Springer twitted him by saying, "Your constituents do not seem to support you."

McKinley's reply is worthy of being carved on his tomb. "My fidelity to my constituents," he said, "is not measured by the support they give. I have convictions which I would not surrender if ten thousand majority had been entered against me."

Elected Governor of Ohio in 1891, and President of the United States in 1897, the remainder of William McKinley's life was passed under the public eye, and throughout it was displayed that high standard of integrity, that fixity of purpose, that earnestness to promote what seemed to him the best good of the country, and that amiability of disposition which had marked his whole public career. He was a strong party man, and made opponents; he can hardly be said to have made enemies, he was too kindly and well-meaning for that. The sentiment with which he was regarded was best shown in those days when he lay suffering, the victim of an assassin, and men of all parties were filled with dread at the threatened loss of a great President and a great man. The quiet resignation of his last words, "Good-bye, all, good-bye. It is God's way, His will be done," was significant of the spirit of his whole life, and the deep grief of the whole country at his death showed the true feeling with which the people everywhere regarded him. The spirit in which he was and will be regarded is well expressed in the closing words of Bishop Andrews' address during state funeral ceremonies at the Capitol: "Washington lives in the hearts and lives of his countrymen; Lincoln, with his infinite sorrow, lives to teach us and lead us on. And McKinley shall summon all statesmen and all his countrymen to purer living, nobler aims, sweeter faith and immortal blessedness."

Bits of Wisdom From President McKinley

"What you want is to get education, and with it you want good character, and with these you want unfaltering industry, and if you have these three things you will have success anywhere and everywhere."

"The thing to-day is to be practical."

"The present and the future hold rich reward for good scholarship, high character and noble endeavor,"

"Money does not make work; work makes money."

"When money is employed, men are employed."

"The path of progress is seldom smooth."

"I want to assure you young people that there is nothing so essential to your easy advancement and success in after life as a good education."

"Honesty, capacity and industry should be fundamental requisites to original appointment and the surest guarantees against removal."

"Doubt in the business world is death to business."

"I am for America because America is for the common people."

"If we are not our brothers' keepers we can be our brothers' helpers."

"Good character is as essential as good education; good morals are more indispensable than learning. Both should go together."

"I love to have the young men about me. I can do no better than to say to them that there is nothing in the world that will serve you so well as good character and clean morals."

"The opportunities for women are greater now than ever before. This is singularly true here, where practically every avenue of human endeavor is open to them."

"While capital waits outside the factory, the machinery within is silent, labor is unemployed and poverty prevails about the firesides of the men who toil."

"Illiteracy must be banished from the land if we shall attain that high destiny as the foremost of the enlightened nations of the world, which, under Providence, we ought to achieve."

"Diversify the products of agriculture, and thus you will have additional employment for your land."

"Business life, whether among ourselves or with other peoples, is ever a sharp struggle for success. It will be none the less so in the future."

"Commerce is a great diplomatist. Fair trading makes fast friends. Commerce, like a circulating library, carries enlightenment wherever it goes."

"Duty determines destiny."

"We must be both 'sure we are right' and 'make haste slowly.'"

FROM THE DISTRICT SCHOOL TO THE UNITED STATES SENATE

THE BOY WHO FAILED IN HIS FIRST EFFORT AT DECLAIMING BECOMES A DISTINGUISHED ORATOR

The fields in which success may be won are as broad as human life. The accumulation of money is only one, and certainly not the highest, of them. Its main purpose is the benefit of one; that of some other fields is the benefit of all. High among these stands statesmanship, and as an example of the loftiest American statesmanship we cannot do better than present the name of the eminent orator, Daniel Webster.

Webster entered Congress at about thirty years of age. He was sent there with the reputation of being one of the leading lawyers of New England, yet few imagined the profound ability as a statesman or the wonderful powers as an orator which this new Congressman, thoughtful, deep-brooding, much revolving, brought with him to the councils of the nation.

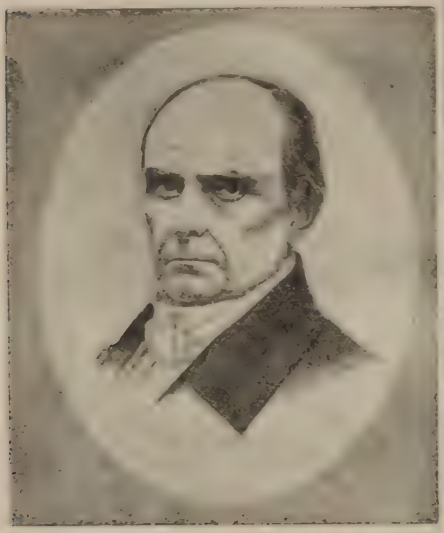
"That my brother and I were tillers of the soil is my greatest pride."—*Daniel Webster.*

The Boy Buys a Handkerchief which Proves to be a Profitable Investment.

Daniel Webster began life as a poor boy, the son of a New Hampshire farmer. He was born a student, and his early feebleness saved him from much of the severe duty which farmwork in New England soil entails. It is of interest to know, in view of Webster's later career, that the first twentyfive cents he ever earned was spent in buying from a peddler a handkerchief on whose surface was printed the Constitution of the United States. The boy

fairly wore out the handkerchief in reading the Constitution, not ceasing till every word of it was impressed upon his memory. But the Constitution was far from satisfying his appetite. Every book he could lay his hands on he read, carrying it about in his pocket and pulling it out to study during the odd minutes which he had to spare after the work-days of his life began. While at work in his father's saw-mill, he would set a log, and read industriously while the saw cut through it.

His father appreciated his studious habits and proposed to give him a college edu-



"There is room at the top."—*Daniel Webster.*

cation. One day, while they were in the hayfield together, a man rode up and spoke for a few minutes with the father. After he had gone Mr. Webster said: "Dan, that man beat me by a few votes in getting into Congress, and for that he had to thank his better education. I intend that you shall have an education, and then I expect you to work your way to Congress."

The prospect of going to an advanced school delighted the studious boy, but he protested strongly against going unless his brother Ezekiel could go too. So the father mortgaged his farm and sent them both. Entering at Phillips Exeter Academy, he worked his way to Dartmouth, teaching and copying law papers to help pay his expenses. Studious as the boy was by inclination, he did not shine in his classes, though his remarable memory and close application gained him credit with tutors. He graduated without distinction, though he could claim a clean record throughout his college career. But his career was another example of the fact that the brilliant graduate is frequently not the one who wins the prize in life.

Working One's Way Through College is an Avenue Open to Every Ambitious Boy.

Meanwhile his brother had finished his studies and was making his mark in the law, and his father had risen to the honor of a judgeship. He offered Daniel a position as clerk of the court, with fifteen hundred dollars a year as salary. The ambitious young graduate refused it.

"I propose to be an actor, not a register of other mens' acts," he said.

"There are more lawyers now than the country needs," said the disappointed old gentleman.

"There is always room at the top," answered the aspiring young man.

He had set his mind on the profession of the law, and no disapproval could stop him. He exhausted the legal lore of the country lawyers, and then went to Boston to study at the fountain head. With patience, hard work, and native talent he made his way to a good position at the Boston bar, and finally fulfilled his father's desire by winning an election to Congress.

Daniel Webster did not win Success without Effort and Endeavor.

We have given these details, though it is not a biographical sketch that we propose. They are of interest as showing that Webster did not win his great success without effort or endeavor. His ability as an orator had already been manifested in the court room and on the political rostrum,

and quickly made itself felt in Congress. It was the period of the war with England, and Webster, from almost his first speech, rose to leadership in the old Federal party, which he supported in its strong disapproval of the war and the Democratic measures.

Leaving Congress in 1816 with an established reputation, he quickly became the leading lawyer in New England; while his great victory in the Dartmouth College case, argued before the United States Supreme Court, won him national fame. After that there was hardly an important case argued before the Supreme Court at Washington in which Webster was not retained by the Government. His deep, musical voice, his commanding figure, his forcible choice of words, his profound knowledge of the law, his imposing delivery, swept all before them, and judge, jury, and spectators alike were often carried away in the deep current of his eloquence.

Webster did not confine himself to legal oratory. He was in demand for orations in honor of great national events, in which he acquitted himself magnificently, the most brilliant of them all, perhaps, being his grand eulogy on the two great patriots, Thomas Jefferson and John Adams, who, by a remarkable coincidence, died together on July 4th, 1826, the fiftieth anniversary of the signing of the Declaration of Independence, in which they were the two leading actors. When his deep, resonant voice pictured before them Jefferson as the author of this memorable document, with Adams as its reader before Congress, the thronged audience in Faneuil Hall were utterly carried away with the enthusiasm of the moment.

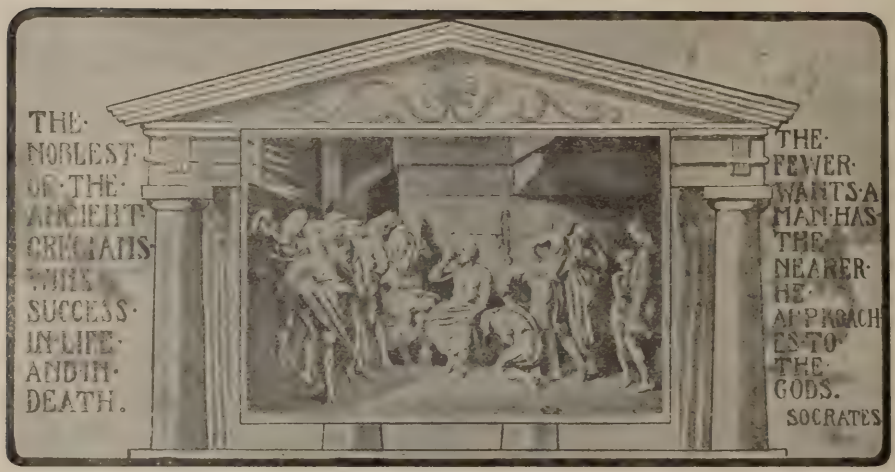
The Culmination of a Life of Hard Work and Study may be a Famous Speech or a Brilliant Deed.

Before this time Webster was back in Congress, and in 1828 he was sent to the Senate, where he reached the summit point of American oratory in January, 1830, in his wonderful reply to Hayne, of South Carolina, on the subject of "nullification" of the laws of the Union. No such speech had been heard before in Congress, none such has been heard since, and it lifted Webster far above a multitude of smaller men to the level of Demosthenes of old.

He lived to be seventy years old, and on his seventieth birthday said, "Work has made me what I am. I never eat a bit of idle bread in my life." His orations, we are told, "take the highest rank among the best productions of the American intellect. They are thoroughly national in their spirit and tone, and are full of principles, arguments, and appeals which come directly home to the hearts and understanding of the great body of the people. They are storehouses of thought and knowledge, solid judgment, high sentiment, and broad and generous views of national policy."

Webster's Definition of True Eloquence.

"True eloquence does not consist in speech. It can not be brought from far. Labor and learning may toil for it, but they will toil in vain. Words and phrases may be marshaled in every way, but they can not compass it. It must exist in the man, in the subject, and in the occasion. Affected passion, intense expression, the pomp of declamation, all may aspire after it—they can not reach it. It comes, if it comes at all, like the outbreaking of a fountain from the earth, or the bursting forth of volcanic fires, with spontaneous, original, native force. The graces taught in the schools, the costly ornaments and studied contrivances of speech, shock and disgust men, when their own lives, and the fate of their wives, their children, and their country hang on the decision of the hour. Then words have lost their power, rhetoric is vain, and all elaborate oratory is contemptible. Even genius itself then feels rebuked and subdued, as in the presence of higher qualities. Then patriotism is eloquent; then self-devotion is eloquent. The clear conception, outrunning the deductions of logic, the high purpose, the firm resolve, the dauntless spirit, speaking on the tongue, beaming from the eye, informing every feature, and urging the whole man onward, right onward to his object,—this, this is eloquence; or, rather, it is something greater and higher than all eloquence: it is action, noble, sublime, Godlike action."


THE NOBLEST OF THE ANCIENT GREEKANS WINS SUCCESS IN LIFE AND IN DEATH.
THE FEWER WANTS A MAN HAS THE NEARER HE APPROACH ES TO THE GODS.
SOCRATES

SOCRATES TAUGHT SUBLIME LESSONS OF MORALITY LEADING TO HAPPINESS AND SUCCESS

There are men to whom wealth is but a weight—a crushing weight if not honorably attained. Such a man was Socrates, the supreme moral teacher of Greece, to whom the highest success meant a crust of bread and freedom to lead the people in the paths of truth and uprightness. For many years he went among the Athenians, especially the young and those ardent for knowledge, until by his teachings, strange alike in manner and matter, his fearless probity, his reproofs for evil doing, his wise utterances, and his sarcastic dealings with wrong in high places he won the bitter hatred of some of the political leaders of Athens.

Unable to controvert him in argument, or to silence him by threat or persuasion, they brought against him a charge of impiety to the old gods of Greece, and, with the aid of false evidence and the serene disdain of Socrates himself, secured his conviction. Death was the penalty, and the venerable teacher, the noblest soul in all Athens, was sentenced to drink the cup of hemlock, the poison to which the judges of that city condemned exalted convicts.

This sentence could not be carried out until the arrival of the sacred ship *Theoris*, which, crowned with laurel, was on its way to the temple of Apollo on the island of Delos. It was a holy festival period at Athens until its return, and the execution of a prisoner during its absence would have polluted the city. The days of waiting thus accorded Socrates were passed by him with ineffable calmness in prison, where a score or more of his disciples had daily access to him. He counselled them here with all the serenity of soul which he had shown when free to discourse in the market-place. He could have escaped in the interval. A plan was formed for his release, but Socrates would not listen to it.

Conversation on the Loftiest Themes.

"I do not think the ship will arrive tomorrow, as you think," said Socrates, "but on the next day. I infer this from a dream I had, just before you came in. It was by some lucky chance that you did not wake me sooner."

"What was your dream?"

"It seemed to me that a woman in white raiment, graceful and fair to look upon, came toward me, and, calling me by name, said, in Homer's words, 'Socrates, on the third day thou shalt reach the coast of fertile Pythia.'"

This dream proved prophetic. The ship arrived on the day stated, and his followers thronged to the prison. His chains had just been taken off. Xanthippe, his wife, was bewailing, and he sent her away. There is a picture of supreme grandeur in the account given by Plato, in his "Phædo," where Socrates, who has been unchained that he may prepare for death, is portrayed as sitting upon his bed, and rubbing his leg gently where the iron has galled it. He begins to speak, not with a complaint against fate or his judges, or the misery of the coming death, but with a grateful reflection. "What an unaccountable thing, my friends, that seems to be which men call pleasure; and how wonderfully it is related to that which appears to be its contrary, pain, in that they will not both be present to a man at the same time; yet if any one pursues and attains the one, he is almost always compelled to receive the other, as if they were united from one head."

Obedience to the Laws a Supreme Duty.

This final interview was spent in marvelous conversation, ending with the words: "That man should be of good courage in regard to his soul, who in his lifetime has striven after knowledge, and adorned his soul with ornaments that befit her,—moderation, justice, courage, freedom, truth,—and thus awaits his journey hence, ready when the voice of fate shall call him. You, too, Simmias, and Cebes, and all the rest of you, must each one take this journey: 'but now,' as a tragic poet would say, 'me the voice of fate is calling;' and it seems better for me to bathe before drinking the poison, and not give the people the trouble of washing my body.''

After the bath, Crito asked, "How do you wish to be buried?"

"Just as you please, if you can catch me," he said, laughing. "It is only the body of Socrates you will bury. After I have drunk the poison, I shall go away to certain joys prepared for the blessed."

Then came his children and the women, and all wished him farewell. The jailer, weeping, assured Socrates that giving the hemlock was not his fault. "How courteous the man is," said the sage.

Crito pleaded that it was not yet sunset and that the fatal moment had not come, but Socrates answered that a few minutes of life were not worth clinging to. Then he asked how to manage with the hemlock.

"Prayer to the Gods is surely allowed," he said, "and must be made, that it may fare well with me on my journey yonder. For this, then, I pray, and so be it."

"Thus speaking," says Plato, "he put the cup to his lips, and right easily and blithely drank it off. All burst into tears and loud grief. But Socrates asked, 'What are you doing, you strange people? I sent away the woman to avoid this discordance; for I have heard that a man ought to die in solemn stillness. So, pray be composed, and restrain yourselves.'

Death Comes Peacefully at the End of a Noble and Lofty Career.

"Hearing this, we were ashamed, and forced back our tears. And he walked about till he began to feel a heaviness in his legs, and then lay down on his back, as he had been told to do. Thereupon, the man who had given the poison, taking hold of him, examined, from time to time, his feet and legs, and then, pressing one foot hard, asked if he felt it, to which he answered, 'No!'—and after that, again his legs, and then still higher, showing us the while that he was getting cold and stiff. Then Socrates himself did the same, and said that by the time the poison had reached his heart, he should be gone. He was then nearly cold up to his waist, when, uncovering his face, for he had covered it up, he said,—and these were his last words—perhaps in the thought of immortal health, 'Crito, we owe a cock to Æsculapius. Pay the debt, and do not forget it.'

"'It shall be done, Socrates,' said he. 'But think if you have nothing else to say.'

"There was no answer to this question; but, after a moment, Socrates stirred, and when the man uncovered him, we saw that his face was set. Crito, seeing this, closed his mouth and eyes. Such was the end of our friend, a man whom we may call, of all men known to us, the best, the wisest and the most just."

PRACTICAL AND FORCEFUL WORDS

—BY—

TWO PRESIDENTS GROVER CLEVELAND AND BENJAMIN HARRISON

Grover Cleveland

"A most absurd thing for men or women to do at any time of life, is to allow the least approach of an idea that because the world owes them a living, the world ought to bring it to them. This is not the way the world behaves. It will pass by all who wait, and bestow it on others who are working or striving, the good things it has in store."

"If one can meet difficulties good-naturedly, and is strong, steadfast and hopeful, there is something really bracing and inspiriting in a determined attack on obstacles."

"Self-reliance, in its full meaning and all its combines, is the greatest motive power that can be brought into your service."

"The self-reliance which you need is a consciousness of having a kind of strength which you are willing to trust because you know the factors that compose it and the training that has developed it."

"A youg man in search of employment found himself in the counting room of a large establishment, in the presence of the proprietor, who, after telling him he had no need of his services, began questioning him for his amusement. Among other things he asked him if he had adopted any motto for his guidance. 'I have,' said the young man, 'and I saw it on the door of this room as I entered.' 'What was that?' said the merchant. 'Push,' was the prompt reply."

Benjamin Harrison

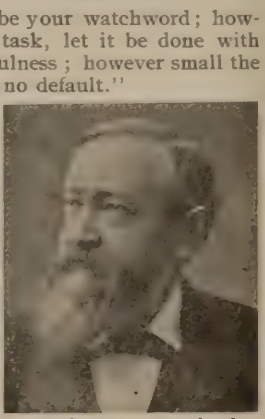
"The old military command, 'Pass the line in front,' is heard very often in the ranks of commerce."

"It is quite as illogical to despise a man because he is rich as because he is poor. Not what a man has, but what he is, settles his class."

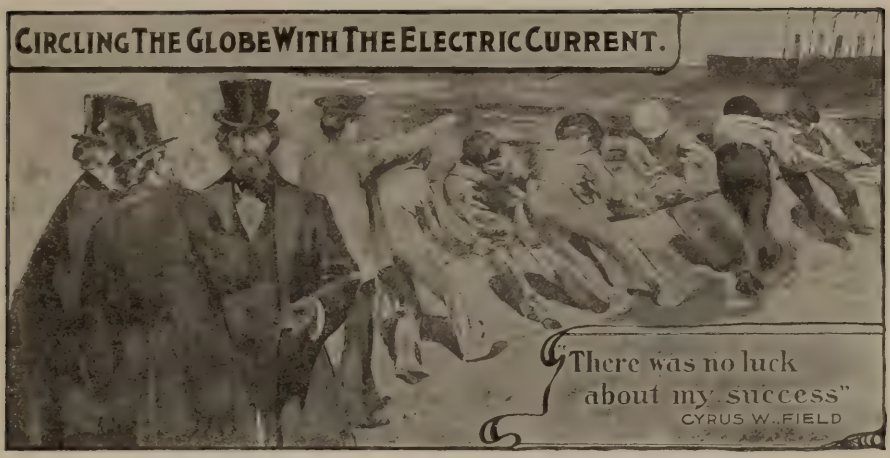
"Men are not made happy or prosperous in the mass, but singly. There is a duty to one's self, to one's family, as well as to society. You do not injure any man if, in the competition of life, by fair methods, by greater skill or thrift, you go to the front."

"There is more good in a moderate accumulation than in great riches, more time for good thoughts and good company, for wife and child and neighbor and God. The highest places are peaks, walking is dangerous, and observation intrusive."

"Let fidelity be your watchword; however simple the task, let it be done with scrupulous faithfulness; however small the trust, let there be no default."



"If you have a way to make in life, the place to begin is where you stand. If it happens to be rock excavation there, don't run forward to find a softer place—it is a waste of time. Life is not like a railroad that can be surveyed from end to end before construction begins. What is not within your reach is clearly not this day's task for you. Aim high, but have regard to the range of your gun."



CYRUS W. FIELD OVERCOMES ALL OBSTACLES AND BECOMES THE BENEFACTOR OF HIS RACE

"Cyrus," said David Dudley Field to his son of fifteen, when the latter left home to enter upon his life duties in New York, "I feel sure you will succeed, for your playmates could never get you off to play until all the work for which you were responsible was done." With that earnest of success in life, and eight dollars in cash, which slender sum his father could not give him without some sacrifice, the future maker of the Atlantic cable set out to begin his business career.

The Field family was a large one, ten in all. One son died young, all the others surviving to make their mark in life. Three of them,—Cyrus West, David Dudley, and Stephen Johnson,—rose to lofty positions in the industrial and legal history of our land, and all their brothers gained some degree of prominence. They were honest, they were earnest, they were persistent and enterprising, and to these qualities they owed their success.

Be Anxious to Learn Your Business From the Start.

What we have to say about these three men must be said briefly. Cyrus stands highest in the world's eye, from the great enterprise and persistence displayed by him, his phenomenal success, and its unsurpassed utility to mankind. He began humbly enough. His first year as errand boy in A. T. Stewart's store brought him only $50 salary; his second year $100. Then he was made a clerk. But in every position he was active and diligent, for, in addition to earning his wages, he was anxious to learn the business thoroughly, and made a close study of every department in the establishment.

The Idea of an Atlantic Cable Develops in Field's Brain

He was hardly past boyhood when he started in business for himself. In this his career was a phenomenal one. Three times the business with which he was connected failed and all he had earned was swept away. Three times he paid every dollar due to his creditors and began again. This strict integrity and unyielding persistence were worth to him unlimited credit, and in spite of his business misfortunes he acquired what in those days was considered wealth.

The idea of the Atlantic cable came to him in this way. Frederick Gisborne had

beggared himself in seeking to build a Newfoundland cable. He came to New York in search of assistance and was introduced to Cyrus W. Field. The large-minded merchant listened to him, turned the subject over in his brain, and one evening as he was looking at the globe in his library the thought came to him: "If Newfoundland and the United States can be connected by a telegraph wire, why not Newfoundland and Ireland?" That thought was the germ of the many thousands of telegraph cable which now run under all seas.

Cyrus Field was one of the men in whose mind a good thought clinches itself and will not let go. The work he did in the dozen years that followed was something enormous. There was organizing of companies, raising of capital, constructing and laying of cables, bitter disappointments, with the whole work to be done over and over again, and persistent holding on until final success was achieved and victory won. The first cable, the work in connection with which represented the labor of a lifetime for many men, broke in midocean and was lost. It needed a Field to bear up and start again after that misfortune. But he was determinded "to moor the New World along side the Old," and with strenuous new endeavor new capital was obtained and a new cable made. This was laid in 1858, and for a brief time proved successful. The Queen and the President sent words of congratulation across the ocean. A few other messages were sent and then it stopped working, and the world's rejoicing turned to doubt and distrust. Some declared that the words claimed to have been sent were false, intended to deceive the public and cheat capitalists, but this did not gain much credit.

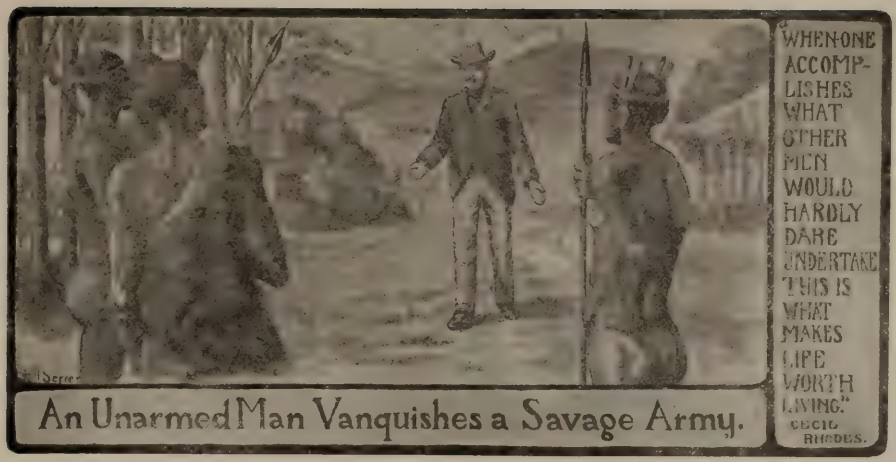
Keeping at it is Always essential to Success.

Cyrus Field was not discouraged. Men had spoken across the ocean by cable. The idea, at least, was a success; simply a better cable was needed. He kept at it, but the American civil war intervened, and it was 1865 before he had another cable ready to lay. Again the wire broke and his hopes were once more buried on the ocean's bed. The indomitable man was not yet defeated. He kept at it still, and had another cable ready to lay in 1866. At last success was attained, the cable held and did its work. Europe and America were made practically one continent, and distance seemed annihilated. Then the *Great Eastern* went back, picked up and spliced the cable lost the year before, and a double channel for speech existed across the Atlantic. Cyrus W. Field had won one of the great victories of the ages. From that day to this men in Europe and America talk with each other as though they were in two adjoining rooms in one building, and to-day there remain no civilized parts of the earth out of the reach of human thought.

Success May be Found in Every Field of Employment.

Of the two celebrated brothers of the famous cable-layer, David Dudley Field won his reputation in the practice and interpretation of the law. He set himself early in his career to an immense task, no less a one than that of reforming the legal system of the English-speaking world, and he did this with a marvellous success. He wrote the Civil Code eight times over, and parts of it eighteen times. It was a great and daring boast he made, but it was a true one, when he said, "The laws which this brain conceived and this hand wrote are the rule of most of the English-speaking communities of the world."

The third brother, Stephen J. Field, won his fame also in the law, serving as a Justice of the Supreme Court of the United States from 1863 to 1897, when he resigned. His life was an adventurous one. He was one of the "Forty-Niners" landing in San Francisco just after Christmas in 1849. He reached there with a fund of ten dollars, of which it cost him seven to have his trunk brought ashore. Breakfast cost him two dollars, and he had but one dollar left, when he met a man who owed his brother $400. He had the note and the man paid him. From this point his progress continued rapid, and in 1857 he was elected Judge of the Supreme Court of California. He was Chief Justice when President Lincoln, in 1863, appointed him to the bench of the Supreme Court of the United States.



An Unarmed Man Vanquishes a Savage Army.

CECIL RHODES MAKES OPPORTUNITY THE PARENT OF A GREAT FORTUNE. AN EMPIRE BUILDER

A great opportunity is the parent of a great fortune. But great opportunities do not come to all men of great business ability. The oil which nature provided made possible the wealth of a Rockefeller, the steel development of the United States came in the right time and place for a Carnegie, the diamond mines of South Africa offered themselves to the organizing genius of a Cecil Rhodes, and these men became strikingly wealthy. Led to Cape Colony for his health, young Rhodes found awaiting him one of the world's great opportunities. If he had not grasped it, some one else would. This is the age of vast combinations, and he was born to do great things.

How a Man In Search of Health Found an Opportunity to Build an Empire.

But Cecil Rhodes was more than a daring business man, he had an imperial soul and was of the type of the empire builders. Fearless, energetic, dominant, with a mind full of large ideas, he was in the way to build an empire in South Africa but for the inflexible obstinacy and enmity of the Boers. As it was, he added a region of imperial extent to the British dominions.

Rhodes revealed himself most fully in one grand event of his life, the one which we here propose to describe, and in which his true character was most fully displayed. The failure of the Jameson raid had overturned his plans, and in Rhodesia, the territory named after himself and which he had added to the British crown, the warlike natives were in arms. Bulawayo, the Rhodesian capital, was beseiged by a raging native horde and affairs seemed very serious for the ascendency of the whites. Rhodes, with his usual energy, hurried to the front horses, arms, provisions and men and then set out to join the force which was marching to the relief of the beleaguered town. But before he reached there the position grew worse, the Mashonas, friendly until now, joined the Matabeles, and a long and costly war loomed up. The South African Company which Rhodes had organized was out of funds. His own large fortune was tied up in his many enterprises. No help could be looked for from England, and the work of his life was all at risk. Success by aid of arms seemed impossible.

In this emergency Cecil Rhodes did what not one man in ten millions would have dared, and in which fewer still would

have succeeded. He determined to go unarmed among the savage Matabeles, and strive to effect by force of character and his ascendency over their minds what it was hopeless to attempt by arms. The three men whom he took with him had revolvers concealed on their persons, but Rhodes was entirely unarmed. Yet he went straight to the Matabele camp and appeared almost like an apparition before the eyes of the astounded chiefs, to whom such daring seemed incredible.

"Esteem and perform public duties as the highest aim."
—*Cecil Rhodes.*

Boldness and Assurance and an Instinctive Appreciation of the Right are Needed in a Crisis.

A council of the natives was being held in a natural amphitheatre, and Rhodes and his three followers walked boldly into its midst, revealed to the eyes of ten thousand warriors, who stood grimly leaning upon their spears. It was a striking situation. A moment's hesitation, a mistake of any kind, and the lives of the intruders would not have been worth a moment's purchase. Only a boldness and assurance and an instinctive appreciation of the right thing to do which few men possess could have given him back his lost supremacy over the chiefs at such a moment as that. The very daring of the movement, the immense bluff of the man, if we may call it so, held them spellbound when Rhodes stepped forward with fearless dignity before them.

He had been all his life a leader of men. He was possessed of marvellous psychical powers which had won him followers in all classes of mankind, and doubtless those rude savages felt the influence of his native ascendency before he began to speak. He had come among them, he said, to hear from them the story of their grievances that he might give them redress. He stood before them in the attitude of the powerful protector, whose word would relieve them of the wrongs from which they had suffered. Then, to the astonishment and fear of his companions, he turned to the leading chiefs and poured upon them a torrent of invective, showering reproaches hot and furious upon their heads. History presents few examples of such dauntless boldness. The lifting of a hand by one of the men accused would have brought him instant death. An ominous growl ran through the ranks of warriors grouped around. But the event proved that Rhodes knew his men. Suddenly one of the oldest and most esteemed of the chiefs cast his rifle and spear at the speaker's feet. Others followed, in quick succession; Rhodes had won; the rebellion was at an end.

Success is its Own Reward.

At one minute death threatened the daring man. In the next he was safe and Matabeland secure. He had left Capetown under a cloud, as the instigator of the Jameson raid. He could return there as an honored citizen, the winner in a battle which few men would have dared, that of unarmed valor against savage fury. As he moved away from the scene of his remarkable victory, that daring man turned to look back at the dark multitude he had subdued and said to his companions, "It is days like this that make life worth living."